Note remarks

Test sheet : CUM 8,3 r 1 : 21.08.91 Edition : 7.1.91 Replaces : ISO-4113 Test oil

: 0 402 736 814 Combination no.

Injection pump

Pump designation : PES6P110A120RS7214 : 0 412 716 805 EP type number

Governor

: RQV350...1200PA964-6 Governor design.

: 0 421 815 258 Governer no.

Customer-spec. information : C.D.C. Customer

: 6CTA-A Engine

: 187.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Coening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rom : 12001st speed

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 2.7...3.3

100 s: (2.5...3.5)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

: 3.10...3.50 rpm : 700 travel mm

3rd speed

: 5.90...6.30 rpm : 1200 travel mm

4th speed

: 9.00...9.20 travel mm rpm : 1400 5th speed

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

Aneroid pressure h: 1200

Del.quantity : 183.0...(188.0)

Spread

cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 62...70

Testing:

1st rack travel in: 13.50

rpm : 1245...1255 Speed

2nd rack travel in: 4.00

rpm : 1405...1435 Speed

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm

Minimum rack trave: 7.20 rpm : 350 Speed

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1200 Rack travel in m: 14.50...14.60

2nd speed rpm : 650 Rack travel in m: 11.60...12.00

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1200 Speed rpm

hPa : 1200 Pressure

: 14.50...14.60 Rack travel mm

Measurement

1/min: 1200 Speed

1st pressure hPa : -Rack travel in m: 7.70...8.10

2nd pressure hPa : 270
Rack travel in m: 9.50...9.60
3rd pressure hPa : 700

Rack travel in m: 12.60...13.00

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Spread

Aneroid pressure h: 1200

: 650 Speed rpm

Del.quantity cm3/: 167.5...173.5 1000 s: (164.5...176.5)

cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm: 500
Del.quantity cm3/: 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13,50

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 27.0...33.0
1000 s: (25.0...35.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: C.D.C. # 3917089

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Note remarks

: CUM 8,3 r 5 : 21.08.91 : 7.1.91 Test sheet Edition Replaces : ISO-4113 Test oil

: 0 402 736 815 Combination no.

Injection pump

Pump designation : PES6P110A120RS7214 : 0 412 716 805 EP type number

Governor

: RQV350...1000PA964-7 Governor design.

: 0 421 815 259 Governer no.

Customer-spec. information : C.D.C. Customer

Engine : 6CTA-A

: 194.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 15.80...15.90

Del.guantity cm3/: 21.7...21.9

100 s: (21.4...22.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 2.7...3.3 100 s: (2.5...3.5)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.60...1.80 travel mm

2nd speed : 450 rom

: 3.00...3.40 travel mm

3rd speed : 600 rpm

: 5.20...5.60 travel mm

: 1000 4th speed rpm

: 8.40...8.60 travel mm

: 1150 5th speed rpm

: 9.80...10.20 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 1500

Del.quantity : 217.0...222.0)

cm3 : 5.00 1000 : (9.00) Spread cm3

RATED SPEED

1st version Control lever

position degrees: 62...70

Testina:

1st rack travel in: 14.30 Speed rpm: 1050...1060 2nd rack travel in: 4.00

Speed rpm : 1205...1235 4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

rpm : 275 Speed Minimum rack trave: 7.20 Speed rpm : 350 Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 15.80...15.90

rpm : 650 2nd speed

Rack travel in m: 14.00...14.40

3rd speed rpm : 1000

Rack travel in m: 15.30...15.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 900 Speed rom hPa : 1500 Pressure

: 15.80...15.90 Rack travel mm

Measurement

1/min: 900 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 340 Rack travel in m: 10.20...10.30

3rd pressure hPa : 840

Rack travel in m: 13.60...14.00

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 650
Del.quantity cm3/: 211.0...217.0
1000 s: (208.0...220.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 98.0...102.0 1000 s: (96.0...104.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.30

rpm : 1050...1060 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 10.90...11.90

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm3/: 27.0...33.0
1000 s: (25.0...35.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: C.D.C. # 3916629

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Note remarks

: CUM 8,3 r 2 Test sheet : 21.08.91 Edition : 7.1.91 Replaces

: ISO-4113 Test oil

: 0 402 736 816 Combination no.

Injection pump

Pump designation : PES6P110A120RS7214

: 0 412 716 805 EP type number

Governor

: RQV350...1200PA964-8 Governor design.

: 0 421 815 264 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

: 213.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 : (4.30...4.50) Prestroke mm

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 14.70...14.80

Del.guantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.80...2.00 travel mm

: 450 2nd speed rpm 3.10...3.50 travel mm

700 3rd speed rpm

5.90...6.30 travel mm

: 1200 4th speed rpm

: 9.00...9.20 travel mm

: 1400 5th speed rpm

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0 1000 : (187.0...195.0)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED

1st version Control Lever

position degrees: 62...70

Testina:

1st rack travel in: 13.20 Speed rpm : 1245...1255

2nd rack travel in: 4.00

Speed rpm : 1400...1430

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 11...19

Testing:

Speed rpm Minimum rack trave: 7.20 : 350 Speed rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 14.70...14.80

2nd speed rpm : 650

Rack travel in m: 12.60...13.00

3rd speed rpm : 1200

Rack travel in m: 14.20...14.40

Aneroid/Altitude Compensator Test

1st version Settina

: 1100 Speed rpm Pressure

hPa : 1200 mm : 14.70...14.80 Rack travel mm

Measurement

1/min: 1100 Speed

1st pressure hPa :

Rack travel in m: 7.80...8.20

2nd pressure hPa : 335 Rack travel in m: 9.60...9.70

3rd pressure hPa : 785

Rack travel in m: 12.80...13.20

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 650 Del.quantity cm3/ : 181.0...187.0

1000 s: (178.0...190.0)

cm3 : 8.00Spread 1000 s: (12.)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.20

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3916626

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Note remarks

: MAN 11,9 t2 Test sheet : 28.06.91 Edition : 1.2.91 Replaces : ISO-4113 Test oil

: 0 402 736 817 Combination no.

Injection pump

Pump designation : PES6P120A720/3LS7209

: 0 412 726 837 EP type number

Governor

: RQV300...1000PA962-3 Governor design.

: 0 421 815 270 Governer no.

Customer-spec. information Customer : MAN

: D2866LF09 Engine

1st version kW : 309.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 Prestroke mm (4.75...4.95)

Rack travel in mm : 15.00...16.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 29.9...30.1

100 s: (29.6...30.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 2.0...2.6

100 s: (1.7...2.9)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed

: 8.30...8.50 travel mm rpm : 300 2nd speed

; 1.90...2.30 travel mm

rpm : 500 3rd speed : 4.00...4.60 travel mm

rpm : 900

4th speed

: 6.50...6.90 travel mm

: 1350 5th speed rpm : 13.00...14.00

travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1140 Speed

A07

Rack travel in mm : 15.20...17.80 Measurement 1/min: 900 FULL LOAD DELIV. AT FULL LOAD STOP Speed 1st pressure hPa : -1st version Rack travel in m: 9.00...9.20 rpm : 900 Speed 2nd pressure hPa : 220 Aneroid pressure h: 1300 : 299.0...301.0 Rack travel in m: 9.40...9.50 Del.quantity 3rd pressure hPa : 720 1000 : (296.0...304.0) cm3 : 5.00 1000 : (9.00) Rack travel in m: 11.50...11.90 Spread START CUT-OUT RATED SPEED Speed 1/min : 220 (240) 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 284...292 1st version Testina: Aneroid pressure h: 1300 1st rack travel in: 12.40 rpm : 1000 rpm : 1040...1050 Speed Speed Del.quantity cm3/: 271.0...277.0 1000 s: (268.0...280.0) 2nd rack travel in: 4.00 Speed rpm : 1140...1170 4th rack travel in: 1300 Aneroid pressure h: 1300 rpm : 0.00...1.00rpm : 750 Speed Speed Del.quantity cm3/: 281.0...287.0 1000 s: (278.0...290.0) LOW IDLE 1 Aneroid pressure h: -Control lever rpm : 500 position degrees: 239...247 Speed Del.quantity cm3/: 168.0...170.0 1000 s: (165.0...173.0) Testina: Speed man Minimum rack trave: 6.50 rpm : 300 **BREAKAWAY** Rack travel in mm : 4.90...5.10 1st version 1mm rack travel less than CONSTANT REGULATION rpm : 300...420 Speed full load rack tr: 12.40 rpm : 1040...1050 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY 1st speed rpm : 900
Rack travel in m: 13.90...14.00 Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0) nd speed rpm : 1000 Rack travel in m: 13.40...13.60 2nd speed rpm : 750 3rd speed Rack travel in m: 12.90...13.10 LOW IDLE 4th speed rpm : 400 Rack travel in m: 12.00...12.30 rpm : 300 Speed Rack travel in mm : 4.80...5.20 Aneroid/Altitude Del.quantity cm3/: 20.0...26.0 1000 s: (17.0...29.0) Compensator Test cm3 : 8.00Spread 1000 s: (12.00) 1st version Setting Remarks: Speed rpm : 900 : MAN-NR. 3-7094 hPa : 1300 Pressure : 13.90...14.00 Rack travel mm

**A08** 

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 11,9 t3 Test sheet : 28.06.91 Edition : 18.2.91 Replaces : ISO-4113 Test oil : 0 402 736 818 Combination no. Injection pump Pump designation : PES6P120A720/3LS7209 EP type number : 0 412 726 837 EP type number Governor : RQV300...1000PA960-4 Governor design. : 0 421 815 272 Governer no. Customer-spec. information Customer : D2866LF09 Engine : 309.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 4.80...4.90 Prestroke mm : (4.75...4.95) Rack travel in mm : 15.00...16.00 : 6-2-4-1-5-3 Firing order : 0-60-120-180-240-300 Phasing Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 6 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference \* CS : 1.75...3.25 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 13.90...14.00 Del.quantity cm3/: 29.9...30.1 100 s: (29.6...30.4) cm3 : 0.5Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm : 4.8...5.2 Del.quantity cm3/: 2.0...2.6 100 s: (1.7...2.9) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1045 1st speed 9.50...9.70 travel mm : 300 2nd speed rpm : 1.40...1.80 travel mm 3rd speed : 500 rpm : 3.50...4.10 travel mm : 900 4th speed rpm : 7.70...8.10 travel mm : 1350 5th speed man : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-Lever position Degree: -1

rpm : 1100

Speed

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Rack travel in mm : 15.20...17.80 Measurement 1/min: 900 Speed FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -1st version Rack travel in m: 9.00...9.20 rpm : 900 Speed 2nd pressure hPa : 220 Aneroid pressure h: 1300 Del.quantity : 299.0...304.0) Rack travel in m: 9.40...9.50 3rd pressure hPa : 720 Rack travel in m: 11.50...11.90 : 5.00 Spread cm3 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 220 (240) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 294...302 1st version Testing: Aneroid pressure h: 1300 1st rack travel in: 12.40 Speed rpm : 1000 Del.quantity cm3/: 271.0...277.0 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 1000 s: (268.0...280.0) rpm : 1140...1170 Speed Aneroid pressure h: 1300 4th rack travel in: 1300 rpm : 0.00...1.00 Speed rpm : 750 Speed Del.quantity cm3/: 281.0...287.0 1000 s: (278.0...290.0) LOW IDLE 1 Aneroid pressure h: -Control lever rpm : 500 Speed position degrees: 247...255 Del.quantity cm3/: 168.0...170.0 1000 s: (165.0...173.0) Testing: Speed rpm : 100Minimum rack trave: 6.50 BREAKAWAY rpm Rack travel in mm : 4.90...5.10 1st version 1mm rack travel less than CONSTANT REGULATION rpm : 300...420 Speed full load rack tr: 12.40 rpm : 1040...1050 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY 1st speed rpm : 900 Rack travel in m: 13.90...14.00 Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 rpm : 1000 2nd speed Rack travel in m: 13.40...13.60 1000 s: (196.0...224.0) 3rd speed rpm : 750 Rack travel in m: 12.90...13.10 4th speed rpm : 400 Rack travel in m: 12.00...12.30 LOW IDLE Speed rpm : 300 Rack travel in mm : 4.80...5.20 Aneroid/Altitude Del.quantity cm3/: 20.0...26.0 Compensator Test 1000 s: (17.0...29.0) cm3 : 8.00 Spread 1000 s: (12.00) 1st version Setting Remarks: : 900 Speed rpm hPa : 1300 : MAN-NR. 3-7095 Pressure

Rack travel mm

: 13.90...14.00

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

Note remarks

Test sheet : MAN 11,9 t5 Edition : 26.07.91

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 736 820

Injection pump

Pump designation : PES6P120A720/3LS7209

EP type number : 0 412 726 837

Governor

Governor design. : RQV300...1000PA960-5

K

Governer no. : 0 421 815 286

Customer—spec. information Customer : MAN

Engine : D2866LU04

1st version kW : 309.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 15.00...16.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 29.4...29.6

100 s: (29.1...29.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.4...5.8 Del.quantity cm3/ : 3.3...3.9

100 s: (3.0...4.2)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 1045

travel mm : 9.80...10.00

2nd speed rpm: 300

travel mm : 1.50...1.70

3rd speed rpm : 500

travel mm : 3.20...3.80

4th speed rpm : 900

travel mm : 8.10...8.50

5th speed rpm: 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1075

Rack travel in mm : 15.20...17.80 Measurement 1/min: 1000 Speed FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -1st version Rack travel in m: 9.00...9.20 2nd pressure hPa : 200 Rack travel in m: 9.40...9.50 Speed rpm : 750 Aneroid pressure h: 1300 : 294.0...296.0 Del.quantity 3rd pressure hPa : 650 Rack travel in m: 11.50...11.70 1000 : (291.0...299.0) cm3 : 5.00 Spread 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 220 (240) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 295...303 1st version Testing: Aneroid pressure h: 1300 1st rack travel in: 12.80 : 1000 rpm : 1040...1050 Speed rpm Speed Del.quantity cm3/: 285.0...291.0 2nd rack travel in: 4.00 1000 s: (282.0...294.0) rpm : 1135...1165 Speed Aneroid pressure h: 1300 4th rack travel in: 1300 : 600 Speed rpm : 0.00...1.00 Speed rom Del.quantity cm3/: 282.0...286.0 1000 s: (279.0...289.0) LOW IDLE 1 Aneroid pressure h: -Control Lever Speed rpm : 500 Del.quantity cm3/ : 169.0...171.0 1000 s: (166.0...174.0) position degrees: 249...257 Testing: rpm : 100 Speed Minimum rack trave: 7.10 rpm : 300 BREAKAWAY Speed Rack travel in mm : 5.50...5.70 1st version 1mm rack travel less than CONSTANT REGULATION rpm : 300...420 Speed full load rack tr: 12.80 Speed rpm : 1040...1050 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY 1st speed rpm : 750 Rack travel in m: 13.50...13.60 2nd speed rpm : 900 rpm : 100 Speed Rack travel in m: 13.70...13.90 d speed rpm : 1000 Rack travel in m: 13.70...13.90 Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) 3rd speed LOW IDLE 4th speed rpm : 600 Rack travel in m: 12.50...12.70 Speed rpm: 300
Rack travel in mm: 5.40...5.80
Del.quantity cm3/: 33.0...39.0 Aneroid/Altitude Compensator Test 1000 s: (30.0...42.0) cm3 : 8.00 Spread 1000 s: (12.00) 1st version Settina Remarks: : 1000 Speed rpm : MAN-NR. 3-7130 hPa : 1300 Pressure : 13.70...13.90 Rack travel mm

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

Note remarks

Test sheet : PER 12,2 b
Edition : 26.07.91
Replaces : 20.11.87
Test oil : ISO-4113

Combination no. : 0 402 746 809

Injection pump

Pump designation : PES6P120A720RS7132

EP type number : 0 412 726 806

Governor

Governor design. : RQ750PA836 Governor no. : 0 421 801 373

Customer—spec. information Customer : PERKINS

Engine : EAGLE LE

1st version kW : 240.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening .

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-4-2-6-3-5

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 15.90...16.00

Del.quantity cm3/: 33.9...34.1

100 s: (33.6...34.4)

Spread cm3:0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 3.8...4.4

100 s: (3.5...4.7)

Spread cm3 : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700

Del.quantity : 339.0...341.0 1000 : (336.0...344.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing:

1st rack travel in: 14.90 Speed rpm : 750...755 2nd rack travel in: 4.00

Speed rpm : 783...798

4th rack travel in: 820

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.90 Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 210.0...240.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

Remarks:

APPLICATION

Generator

Note remarks

: MB 12,0 a 2 Test sheet : 05.07.91 Edition : 15.8.89 Replaces : ISO-4113 Test oil

: 0 402 746 841 Combination no.

Injection pump

Pump designation : PES6P120A720LS7114-2

EP type number : 0 412 726 815

Governor

Governor design. : RQ300/1050PA774-3

Governer no. : 0 421 801 451

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M447 LA Engine

: 265.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 5.8...6.2 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 900

Del.quantity : 229.0...234.0)

: 5.00 cm3

Spread 1000 : (9.00)

RATED SPEED

1st version

Setting point: : 600 Speed rom Rack travel in mm : 20.0

Testing: 1st rack travel in: 13.20 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rpm Speed Rack travel in mm: 6.0 : 300 Speed rpm Rack travel in mm: 5.80...6.20 Rack travel in mm: 2.00 : 360...400 Speed rpm TORQUE CONTROL : ? Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 14.20...14.40 3rd speed rpm : 700 Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed man hPa : 700 Pressure : 14.00...14.20 Remarks: Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 12.00...12.20 2nd pressure hPa : 500
Rack travel in m: 13.40...13.60
3rd pressure hPa : 1100 Rack travel in m: 14.20...14.40 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa Rack travel in m: 10.40...10.70 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500

Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 700 Del.quantity cm3/: 246.0...249.0 1000 s: (243.0...252.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -; 500 Speed rpm Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00 Spread 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.20 rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

: 100 Speed riom Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0)

Speed

rpm : 1050

### Note remarks

Test sheet : MB 12.0 a 5
Edition : 05.07.91
Replaces : 2.10.89
Test oil : ISO-4113

Combination no. : 0 402 746 859

Injection pump

Pump designation : PES6P120A720LS7114-2

EP type number : 0 412 726 815

Governor

Governor design. : RQV300...1050PA940-2

Governer no. : 0 421 813 826

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kW : 265.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3:0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.8...6.2 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.30 2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm: 800

travel mm : 5.90...6.20

4th speed rpm : 1100

travel mm : 8.10...8.50 5th speed rpm : 1175

travel mm : 9.70...10.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 900 : 229.0...231.0 Del.quantity : (226.0...234.0) : 5.00 : (9.00) 1000 Spread cm3START CUT-OUT 1000 Speed RATED SPEED 1st version Control lever position degrees: 117...125 1st version Testing: Speed 1st rack travel in: 13.20 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1150...1180 Spread Speed 4th rack travel in: 1250 Speed rpm: 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 80...88 Spread Testing: Speed : 200 rpm Minimum rack trave: 8.00 : 300 rom Rack travel in mm : 5.80...6.20 Spread CONSTANT REGULATION rpm : 300...450 Speed **BREAKAWAY** TORQUE CONTROL : 0.50 Dimension a mm 1st version nd speed rpm : 1050 Rack travel in m: 14.20...14.40 nd speed rpm : 700 2nd speed 3rd speed Rack travel in m: 14.70...14.90 Speed Aneroid/Altitude Compensator Test Speed 1st version Setting : 600 Speed rpm hPa : 700 Remarks: Pressure : 14.00...14.20 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.80...12.00 2nd pressure hPa : 500 Rack travel in m: 13.40...13.60 3rd pressure hPa : 1100

Rack travel in m: 14.20...14.40 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa : Rack travel in m: 10.40...10.70 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS Aneroid pressure h: 1500 rpm : 1050 Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) cm3: 8.00 1000 s: (12.0) Aneroid pressure h: 1500 : 700 man Del.quantity cm3/: 246.0...249.0 1000 s: (243.0...252.0) ; 8.00 cm3 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00 1000 s: (12.0) 1mm rack travel less than full load rack tr: 13.20 Speed rpm : 1090...1100 STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.35...4.45 : (4.30...4.50) Prestroke mm Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 : FOR 7,8 k 1 : 30.08.91 Firing order Test sheet Edition : 16.11.90 Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing Combination no. : 0 402 746 863 : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PES6P120A720RS7179 Time to cyl. no. : 1 : 0 412 726 826 EP type number BASIC SETTING Governor Governor design. : RQV350...1150PA917K rpm: 1150 : 0 421 815 214 1st speed Governer no. Rack travel in mm : 14.00...14.10 Customer-spec. information Customer : FNH Del.quantity cm3/: 21.7...21.9 : 7.8L Engine 100 s: (21.4...22.2) : 201.0 1st version kW cm3 : 0.7: 2300 Rated speed Spread 100 s: (1.1) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.0...2.6 Test oil inlet temp. °C : 38...42 100 s: (1.8...2.8) Overflow valve cm3 : 0.5: 2 417 413 072 Spread 100 s: (0.9) Overflow (B) Setting of injection pump quantity min. 1/h: 160...170 with governor Test nozzle holder : 1 688 901 103 GUIDE SLEEVE TRAVEL assembly rom : 1215 1st speed : 9.40...9.60 travel mm Opening : 350 : 207...210 2nd speed pressure, bar rom : 2.20...2.40 travel mm 3rd speed : 450 rpm Orifice plate travel mm 3.40...4.00 diameter mm : 0,7 : 800 4th speed rpm : 6.10...6.50 travel mm : 1550 Test lines : 1 680 750 008 5th speed rpm : 13.00...14.00 travel mm Outside diameter GUIDE SLEEVE POSITION x Wall thickness Control-lever position : 6.00X2.00X600 x Length mm Dearee: -1 rpm : 1380 (A) Injection pump setting values Rack travel in mm : 6.00...13.00 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values 1st version BEGINNING OF DELIVERY

rpm : 1150

Speed

Test pressure, bar: 17...19

Aneroid pressure h: 1400 Del.quantity : 217.0...219.0 Anerotu p. ... Del.quantity 1000

1000 : (214.0...222.0) cm3 : 7.00 1000 : (11.00)

Spread

RATED SPEED

1st version Control Lever

position degrees: 116...124

Testina:

1st rack travel in: 13.00

: 1210...1220 Speed rpm

2nd rack travel in: 4.00

: 1345...1375 Speed man

4th rack travel in: 1450

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 64...72

Testing:

Speed : 100 rom Minimum rack trave: 6.70 rpm : 350

Rack travel in mm : 5.00...5.40

CONSTANT REGULATION

rpm : 320...440 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1150 1st speed

Rack travel in m: 14.00...14.10

rpm : 750 2nd speed

Rack travel in m: 12.40...12.60

rpm : 550 3rd speed

Rack travel in m: 11.30...11.70

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1150 Speed rpm hPa : 1400 Pressure

Rack travel mm : 14.00...14.10

Measurement

1/min: 1150 Speed

1st pressure hPa : -

Rack travel in m: 7.90...8.30 2nd pressure hPa : 300 Rack travel in m: 9.50...9.60

3rd pressure hPa : 850

Rack travel in m: 12.40...12.80

START CUT-OUT

Speed

1/min: 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

: 750 Speed rpm

Del.quantity cm3/: 212.0...218.0 1000 s: (209.0...221.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 110.0...114.0

1000 s: (108.0...116.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 1210...1220 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 150.0...180.0 1000 s: (145.0...185.0) Rack travel in mm: 10.90...11.50

Remarks:

: FNH # E9HN-9A543-TA

Bow dimension:

Sliding-sleeve position = 37.0 mm

Note remarks

: RVI 6,2 h Test sheet : 21.06.91 : 28.9.90 Edition Replaces : ISO-4113 Test oil

: 0 402 746 883 Combination no.

Injection pump

Pump designation : PES6P110A320RS7198 : 0 412 716 802 EP type number

Governor

Governor design. : RQV275...1250PA942K

: 0 421 815 234 Governer no.

Customer-spec. information Customer : RVI

: MIDRO6-06-26 Engine

1st version kW : 132.5 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.60...4.70 Prestroke mm : (4.55...4.75)

Rack travel in mm : 12.50...13.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...15.00 & maximum rack tra: 20.0...21.0 Difference ° CS : 2.50...4.00

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 15.4...15.6

100 s: (15.1...15.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 275 2nd speed

Rack travel in mm : 5.00...5.40 Del.quantity cm3/ : 1.8...2.3

100 s: (1.5...2.5)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed

: 9.70...9.90 travel mm

: 275 2nd speed rpm

: 0.90...1.10 travel mm

3rd speed : 600 rpm

: 4.20...4.60 travel mm

: 1000 4th speed rpm

: 7.10...7.50 travel mm

: 1600 5th speed rpm : 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1370 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

**A24** 

1st version rpm : 1250 Speed Aneroid pressure h: 1000 Del.quantity : 154.0...158.5) : 4.00 cm3 Spread 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 13.50 rpm : 1315...1325 Speed 2nd rack travel in: 4.00 rpm : 1475...1505 Speed 4th rack travel in: 1600 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 58...66 Testina: Speed man Minimum rack trave: 6.00 rpm : 275 Speed Rack travel in mm : 5.10...5.30 CONSTANT REGULATION rpm : 350...480 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 14.50...14.60 rpm : 750 2nd speed Rack travel in m: 13.60...13.80 : 400 3rd speed rom Rack travel in m: 12.80...13.20 Aneroid/Altitude Compensator Test 1st version Setting : 1250 Speed rpm hPa : 1000 Pressure : 14.50...14.60 Rack travel mm

Measurement 1/min: 1250 Speed 1st pressure hPa : -Rack travel in m: 11.20...11.60 A25

2nd pressure hPa : 360 Rack travel in m: 12.80...12.90 3rd pressure hPa : 220 Rack travel in m: 11.80...12.20 START CUT-OUT 1/min : 200 (220) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 750 Del.quantity cm3/ : 119.0...123.0 1000 s: (116.0...126.0) Ameroid pressure h: rpm : 500 Speed Del.quantity cm3/: 67.0...69.0 1000 s: (64.5...71.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.50 : 1315...1325 Speed COM STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0) LOW IDLE : 275 Speed rom Rack travel in mm : 5.00...5.40 Del.quantity cm3/: 18.0...23.0 1000 s: (15.5...25.5) : 4.50 Spread cm3 1000 s: (7.50) Remarks:

Note remarks

: RVI 6,2 i : 21.06.91 Test sheet Edition : 18.2.91 Replaces : ISO-4113 Test oil

: 0 402 746 894 Combination no.

Injection pump

Pump designation : PES6P110A320RS7208 EP type number : 0 412 716 803

Governor

: RQV275...1175PA942-1 Governor design.

: 0 421 815 244 Governer no.

Customer-spec. information Customer : RVI

: MIDRO60226 M Engine

: 210.0 1st version kW : 2350 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm

: 4.10...4.20 : (4.05...4.25) Rack travel in mm : 13.00...14.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10 & maximum rack tra: 20.0...21.0 Difference ° C3 : 2.75...4.25

BASIC SETTING

1st speed rpm: 1175

Rack travel in mm : 14.00...14.10

Del.guantity cm3/: 17.0...17.2

100 s: (16.7...17.4)

cm3 : 0.4 Spread

100 s: (0.7)

2nd speed rpm : 275.0 Rack travel in mm : 5.00...5.40 Del.quantity cm3/ : 2.0...2.5

100 s: (1.7...2.7)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1320 ; 9.70...9.90 travel mm

: 275 2nd speed rpm

: 0.90...1.10 travel mm

: 600 3rd speed rpm

: 4.20...4.60 travel mm

: 1000 4th speed rom

: 7.10...7.50 travel mm

: 1600 5th speed rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1370 Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 1175 Speed Aneroid pressure h: 1000 Del.quantity : 170.0...172.0 1000 : (167.5...174.5) Spread cm3 : 4.00 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 13.00 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 Speed rpm : 1420...1450 4th rack travel in: 1600 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 56...64 Testing: Speed rpm : 200 Minimum rack trave: 5.90 rpm : 275 Rack travel in mm : 5.20...5.40 CONSTANT REGULATION rpm : 350...480 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1175
Rack travel in m: 14.00...14.10
2nd speed rpm : 700
Rack travel in m: 13.25...13.45
3rd speed rpm : 800 Rack travel in m: 13.50...13.80 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 1175 hPa : 1000 Pressure : 14.00...14.10 Rack travel mm Measurement 1/min : 1175 Speed 1st pressure hPa : -

2nd pressure hPa : 520 Rack travel in m: 12.30...12.50 3rd pressure hPa : 240 Rack travel in m: 10.90...11.30 START CUT-OUT 1/min: 200 (220) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/ : 148.0...154.0 1000 s: (145.0...157.0) Aneroid pressure h: Speed rpm : 500 Del.quantity cm3/ : 73.0...75.0 1000 s: (70.5...77.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1245...1255 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 90.0...120.0 1000 s: (86.0...124.0) LOW IDLE Speed rpm : 275
Rack travel in mm : 5.00...5.60
Del.quantity cm3/ : 20.0...25.0
1000 s: (17.5...27.5)
Spread cm3 : 4.50 1000 s: (7.50) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Rack travel in m: 10.30...10.90

Note remarks

: MAN 11,9 x1 Test sheet : 27.05.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 746 905 Combination no.

Injection pump

Pump designation : PES6P120A720LS7227-1

EP type number

: 0 412 726 845

Governor

Governor design. : RQ750PA981 : 0 421 801 566 Governer no.

Customer-spec. information : MAN Customer

: D2866 LXE Engine

: 300.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.70...4.80 Prestroke mm : (4.65...4.85)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 6

BASIC SETTING

rpm: 700 1st speed

Rack trave! in mm: 14.30...14.40

Del.quantity cm3/: 33.9...34.1

100 s: (33.6...34.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.2...4.6

Del.quantity cm3/: 2.0...2.6

100 s: (1.7...2.9) cm3 : 0.8

Spread 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 339.0...341.0 Del.quantity

1000 : (336.0...344.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 13.30

rpm : 750...755 Speed

2nd rack travel in: 4.00 rpm : 788...801 Speed

4th rack travel in: 950

rpm : 0.00...1.00Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.30 Speed rpm : 750...755

Remarks:

Remarks: : MAN-NR. 3-7119 APPLICATION

Generator set

: 4.65...4.75 Prestroke mm BOSCH INJ. PUMP TEST SPECIFICATIONS : (4.60...4.80) Rack travel in mm : 18.00...21.00 Note remarks : 1-5-3-6-2-4 firing order : RVI 9,8 o 1 : 23.08.91 : 26.7.91 Test sheet Edition Replaces : ISO-4113 : 0-60-120-180-240-300 Phasina Test oil Tolerance + - ° : 0.50 (0.75) : 0 402 746 915 Combination no. BASIC SETTING Injection pump Pump designation : PES6F120A320RS7232 rpm: 600 : 0 412 726 846 1st speed EP type number Governor Rack travel in mm : 13.10...13.20 : RQ275/1050PA999-2 Governor design. : 0 421 801 594 Governer no. Del.quantity cm3/: 23.5...23.7 Customer-spec. information 100 s: (23.2...24.0) : RVI Customer cm3 : 0.5: MIDR 06-20-45 Spread Engine : 249.0 : 2100 100 s: (0.9) 1st version kW Rated speed rpm : 275 2nd speed Rack travel in mm : 4.60...5.00 TEST BENCH REQUIREMENTS Del.guantity cm3/: 1.5...2.1 100 s: (1.2...2.4) Test oil cm3 : 0.8inlet temp. °C : 38...42 Spread 100 s: (1.2) Overflow valve GUIDE SLEEVE POSITION : 1 417 413 025 Control-lever position Degree: -2 Inlet press., bar: 1.50 rpm : 600 Speed Rack travel in mm : 19.20...20.80 Test nozzle holder : 1 688 901 105 assembly FULL LOAD DELIV. AT FULL LOAD STOP Opening . : 207...210 1st version pressure, bar Speed rpm : 600 Aneroid pressure h: 1000 Orifice plate : 235.0...237.0 Del.quantity diameter mm : 0.8 1000 : (232.0...240.0) : 5.00 Spread cm31000 : (9.00) : 1 680 750 015 Test lines Outside diameter RATED SPEED x Wall thickness 1st version : 6.00x1.50x600 x Length mm Setting point: (A) Injection pump setting values Insp. values in parentheses Speed Rack travel in mm: 20.0 Set equal delivery quant. per values Testing: 1st rack travel in: 12.10 BEGINNING OF DELIVERY

rpm : 1125...1140

Speed

2nd rack travel in: 4.00

Test pressure, bar: 25...27

rpm : 1235...1265 Speed 4th rack travel in: 1350

rpm : 0.00...1.00

LOW IDLE 1 Setting point w/out bumper spring

rpm : 4.80

Testing: mpm : 200 Speed

Minimum rack trave: 6.00 rpm : 275

Rack travel in mm: 4.70...4.90
Rack travel in mm: 2.00
Speed rpm: 350...390

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

rpm : 600 1st speed

Rack travel in m: 13.50...13.60

2nd speed rpm : 1050

Rack travel in m: 13.40...13.60

Aneroid/Altitude Compensator Test

1st version Settina

Speed rpm : 500 hPa : 1000 Pressure

Rack travel mm : 13.10...13.20

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 8.60...9.00

2nd pressure hPa : 560

Rack travel in m: 12.50...12.60 3rd pressure hPa : 200

Rack travel in m: 9.60...10.00

START CUT-OUT

1/min: 225 (245) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 : 1050 Speed rpm

Del.quantity cm3/: 211.0...217.0 1000 s: (208.0...220.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 92.0...94.0 1000 s: (89.0...97.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.10

rpm : 1125...1140 Speed

STARTING FUEL DELIVERY

rom : 100 Speed

Del.quantity cm3/: 130.0...160.0 1000 s: (126.0...164.0)

LOW IDLE

rpm : 275 Speed

Rack travel in mm : 4.60...5.00 Del.quantity cm3/: 15.0...21.0

1000 s: (12.0...24.0)

cm3 : 8.00Spread 1000 s: (12.00)

Remarks:

Note remarks

: BAO 15,9 d Test sheet : 21.08.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 746 920 Combination no.

Injection pump

Pump designation : PES6P120A320RS7241

EP type number : 0 412 726 854

Governor

Governor design. : RQV350...900PA935-1

: 0 421 813 820 Governer no.

Customer-spec. information : BAUDOUIN Customer

: 6P15 2E Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm 3,0:

: 1 680 750 074 Test Lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

: 3.60...3.70 : (3.55...3.75)

Rack travel in mm : 9.00...12.00

Tolerance + - °

Phasing

Firing order

: 0-60-120-180-240-300

: 1-5-3-6-2-4

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 33.9...34.1

100 s: (33.6...34.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm: 4.5...4.9

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 945 1st speed

: 8.40...8.60 travel mm

rpm : 350 2nd speed

: 1.30...1.70 travel mm

: 550 3rd speed rpm

: 3.60...4.20 : 750 travel mm

4th speed rpm

: 5.90...6.30 travel mm

rpm : 1200 5th speed

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 940

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 900 Speed

; 339.0...341.0 1000 : (336.0...344.0) Del.quantity

: 5.00 Spread cm3

1000 : (9.00)

### RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 11.00 Speed rpm : 940...950 2nd rack travel in: 4.00 Speed rpm : 1000...1030

4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 80...88

Testing:

Speed rpm : 100 Minimum rack trave: 6.20 Speed rpm : 350 Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 350...450

START CUT-OUT

Speed 1/min: 270 (290)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.00 Speed rpm : 940...950

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: MWM 6,2 G 1 : 26.07.91 : 05.07.91 Test sheet Edition Replaces

Test oil : ISO-4113

: 0 403 436 113 Combination no.

Injection pump

: PES6MW100/320/3RS116 Pump designation

: 0 413 406 149 EP type number

Governor

Governor design. : RQ300/1000MW117 : 0 420 082 057 Governer no.

Customer-spec. information : MWM Customer

: TBD2268-6 Enaine

: 150.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

: 172...175 pressure, bar

: 1 680 740 014 Test Lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 14.4...14.6

100 s: (14.2...14.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm: 7.0...7.2

Del.quantity cm3/: 1.1...1.5 100 s: (0.8...1.7)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1100 1st speed : 7.30...7.70 travel mm

rpm : 1000 2nd speed

: 5.90...6.10 travel mm : 370 3rd speed rpm

: 4.70...5.30 travel mm

: 300 4th speed mqn

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

Speed rpm: 600 Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1200

: 144.0...146.0 Del.quantity 1000 : (142.0...148.0)

cm3 : 3.50Spread

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 91...99 Setting point: Speed rpm : 600 Rack travel in mm : 20.0 Testina: 1st rack travel in: 11.40 rpm : 1040...1055 Speed 2nd rack travel in: 4.00 Speed rpm : 1140...1170 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 74...82 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.1 Testina: rpm : 200 Speed Minimum rack trave: 8.50 Speed rpm: 300 Rack travel in mm : 7.00...7.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 Speed hPa : -Pressure Rack travel mm : 8.90...9.00 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 9.50...9.70 2nd pressure hPa : 650 Rack travel in m: 11.50...11.70

3rd pressure hPa : 1200

Rack travel in m: 12.40...12.50 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 143.5...146.5 1000 s: (141.0...149.0) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 64.0...66.0 1000 s: (62.0...68.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 Speed rpm : 1040...1055 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0 1000 s: (97.0...113.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 7.00...7.20 Del.quantity cm3/ : 11.0...15.0 1000 s: (8.5...17.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

**B**07

Speed

1st version

Aneroid pressure h: 1200

rpm : 750

#### Note remarks

: VOL 4,5 N Test sheet : 26.07.91 Edition

Replaces

: ISO-4113 Test oil

: 0 403 444 130 Combination no.

Injection pump

Pump designation : PES4MW100/320RS1220

EP type number : 0 413 404 116

Governor

Governor design. : RQV300...1200MW39-2

: 0 420 083 059 Governer no.

Customer-spec. information Customer : VME

: TD45B Engine

: 82.5 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 173...176 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-

**B08** 

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 12.20...12.30

Del.auantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm : 6.4...6.6 Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.3 Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1300 1st speed

: 9.50...10.00 travel mm

: 1250 2nd speed rpm

: 8.80...9.00 travel mm

: 380 3rd speed rpm

: 1.50...2.10 travel mm : 300 4th speed rpm

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1200 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 100.0...102.0 Del.quantity

1000 : (98.0...104.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 100...108 Setting point: Speed rpm : 1200 Rack travel in mm: 16.5 Testing: 1st rack travel in: 11.20 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 Speed rpm : 1290...1320 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 70...78 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testing: Speed rpm : 100 Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 6.40...6.60 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1000 Speed Del.quantity cm3/: 101.0...105.0 1000 s: (99.0...107.0) Spread cm3: 5.50 1000 s: (7.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 1240...1250 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...140.0 1000 s: (127.0...143.0)

Remarks:

LOW IDLE

Note remarks

: VOL 4,5 N1 : 26.07.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 403 444 131 Combination no.

Injection pump

Pump designation : PES4MW100/320RS1220

EP type number : 0 413 404 116

Governor

Governor design. : RQV300...1100MW39-4

: 0 420 083 067 Governer no.

Customer-spec. information

Customer

: TD45B Engine

1st version kW : 82.5

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 173...176 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 9.4...9.6

100 s: (9.2...9.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed

Rack travel in mm : 6.4...6.5 Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9) cm3 : 0.3Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1220 1st speed

: 9.20,..9.60 travel mm

rpm : 1150 2nd speed

: 8.40...8.60 travel mm

rpm : 420 3rd speed

: 1.70...2.30 travel mm rpm : 300 4th speed

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 94.0...96.0 Del.quantity

: (92.0...98.0) : 3.50 1000

cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

**B10** 

Control lever position degrees: 100...108 Setting point: : 1150 Speed rpm Rack travel in mm: 16.5 Testina: 1st rack travel in: 10.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1350 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.5 Testing: : 100 Speed rom Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 6.40...6.60 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 1000 Speed rpm Del.quantity cm3/: 96.5...99.5 1000 s: (94.0...102.0) cm3 : 5.50 Spread 1000 s: (7.0) Speed rpm: 900 Del.quantity cm3/: 95.5...98.5 1000 s: (93.0...101.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.50
Del.quantity cm3/: 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50

spread cms : 3.50 1000 s: (5.50)

Remarks:

B11

Speed

Note remarks

: VOL 4,5 0 Test sheet : 26.07.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 403 444 132

Injection pump

Pump designation : PES4MW100/320RS1222

: 0 413 404 117 EP type number

Governor

Governor design. : RQV300...1100MW39-5

: 0 420 083 068 Governer no.

Customer-spec. information Customer : VME

: TD45B Engine

: 88.5 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 173...176

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 Prestroke mm : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 11.7...11.9

100 s: (11.5...12.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 6.4...6.6

Del.quantity cm3/: 1.3...1.7 100 s: (1.0...1.9)

cm3 : 0.3 Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1225 1st speed

: 9.40...9.80 travel mm

rpm : 1150 2nd speed

: 8.30...8.50 travel mm

: 600 3rd speed rom : 2.70...3.30

travel mm : 300 4th speed rom

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 117.0...119.0 Del.quantity

1000 : (115.0...121.0)

: 3.50 : (6.00) cm3 Spread

1000

RATED SPEED

1st version

**B12** 

Control lever

position degrees: 100...108

Testina:

1st rack travel in: 12.00

rpm : 1140...1750 Speed

2nd rack travel in: 4.00

Speed rpm : 1225...1255

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control Lever

position degrees: 70...78

Setting point w/out bumper spring

: 300 rpm Rack travel in mm: 6.5

Testina:

rpm : 100 Speed

Minimum rack trave: 8.00 rpm : 300 Speed

Rack travel in mm : 6.40...6.60

START CUT-OUT

1/min: 220 (250) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 1000 Speed

Del.quantity cm3/: 115.5...118.5 1000 s: (113.0...121.0) Spread cm3: 5.50 1000 s: (7.0)

RACK STOP ADJUSTMENT

rpm : 100 Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...160.0 1000 s: (147.0...163.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

**B13** 

Speed rpm : 300 Rack travel in mm : 6.40...6.60

Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) Spread cm3 : 3.50 1000 s: (5.50)

:

Remarks:

Note remarks

: MB 4,0 I 3 Test sheet : 26.07.91 Edition

Replaces

: ISO-4113 Test oil

: 0 403 444 133 Combination no.

Injection pump

Pump designation : PES4MW100/720RS1212

: 0 413 404 114 EP type number

Governor

Governor design. : RQV300...1300MW50-20

: 0 420 083 252 Governer no.

Customer-spec. information : MB-NFZ Customer

: OM 364 LA Engine

: 99.0 1st version kW Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 750 015 Test Lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

**B14** 

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 6.8...7.0

Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed

: 9.50...9.90 travel mm

rpm : 1340 2nd speed

: 8.50...8.70 travel mm

: 500 3rd speed rpm

: 2.70...3.30 travel mm

: 300 4th speed rpm

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1340 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

Aneroid pressure h: 700

: 98.0...100.0 Del.quantity 1000 : (96.0...102.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 90...98 Testing: 1st rack travel in: 12.50 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 Speed rpm : 1345...1375 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.9 Testing: : 200 Speed rom Minimum rack trave: 8.50 rpm : 300 Rack travel in mm: 6.80...7.00 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure Rack travel mm : 11.00...11.10 Measurement Speed 1/min: 500 1st pressure hPa : 200 Rack travel in m: 11.90...12.00 2nd pressure hPa : 375 Rack travel in m: 12.90...13.20 3rd pressure hPa : 700 Rack travel in m: 13.50...13.60 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 600 Speed rom Del.quantity cm3/: 83.5...86.5 1000 s: (81.0...89.0) cm3 : 5.00Spread 1000 s: (7.0)

Speed rpm : 500 Del.quantity cm3/: 40.0...42.0 1000 s: (38.0...44.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.50 rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 85.0...95.0 1000 s: (82.0...98.0)

LOW IDLE

Speed : 300 rpm Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

**B15** 

Aneroid pressure h: -

: 4.00...4.10 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm (3.95...4.15)

Rack travel in mm: 9.00...12.00

Firing order: 1-5-3-6-2-4 Note remarks Firing order : FIA 8,1 D 1 : 26.07.91 Test sheet Edition Replaces : 0-60-120-180-240-300 Phasing : ISO-4113 Test oil : 0.50 (0.75) : 0 403 446 284 Tolerance + - ° Combination no. BASIC SETTING Injection pump Pump designation : PES6MW100/720RS1197 rpm: 1250 1st speed EP type number : 0 413 406 185 Governor Rack travel in mm : 14.50...14.60 Governor design. : RQV325...1250MW109-1 Del.quantity cm3/: 10.5...10.7 : 0 420 083 995 Governer no. 100 s: (10.3...10.9) Customer-spec. information : IVECO-FIAT Customer cm3 : 0.3Spread : 8060.45.6090 Engine 100 s: (0.6) : 2500 Rated speed 2nd speed rpm : 325.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/ : 2.0...2.4 100 s: (1.7...2.6) TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 457 413 010 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder : 1 688 901 101 rpm : 1400 1st speed assembly : 10.00...10.40 travel mm rpm : 825 2nd speed **Opening** : 4.90...5.10 travel mm : 207...210 pressure, bar rpm : 400 3rd speed : 2.90...3.50 travel mm Orifice plate rpm : 325 4th speed diameter mm : 0,6 : 1.50...1.90 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 014 1st version Outside diameter rpm : 1250 x Wall thickness Speed Aneroid pressure h: 1000 : 6.00x2.00x600 x Length mm : 105.0...107.0 Del.quantity 1000 : (103.0...109.0) cm3 : 3.50 (A) Injection pump setting values Insp. values in parentheses Spread 1000 : (6.00) Set equal delivery quant. per values RATED SPEED BEGINNING OF DELIVERY Test pressure, bar: 30...32 1st version

Control lever

position degrees: 112...120

Del.quantity cm3/: 108.0...111.0 1000 s: (105.5...113.5) Spread cm3 : 5.00 1000 s: (7.0) Testing: 1st rack travel in: 13.50 rpm : 1310...1320 Speed Aneroid pressure h: 1000 2nd rack travel in: 4.00 : 900 rpm : 1445...1475 Speed rom Speed Del.quantity cm3/: 105.5...108.5 4th rack travel in: 1550 1000 s: (103.0...111.0) rpm : 0.00...1.00Speed Aneroid pressure h: 1000 : 600 Speed LOW IDLE 1 rpm Del.quantity cm3/: 115.5...118.5 1000 s: (113.0...121.0) Control Lever position degrees: 74...82 Setting point w/out bumper spring Aneroid pressure h: rpm\_ : 500 Speed rpm : 325 Rack travel in mm : 7.6 Speed Del.quantity cm3/: 65.5...67.5 1000 s: (63.5...69.5) Testing: Speed : 200 rpm Minimum rack trave: 10.00 **BREAKAWAY** : 325 Speed rpm 1st version Rack travel in mm : 7.50...7.70 1mm rack travel less than TORQUE CONTROL full load rack tr: 13.50 Torque control curve - 1st version rpm : 1310...1320 rpm : 1250 Speed 1st speed Rack travel in m: 14.50...14.60 2nd speed rpm : 1100 STARTING FUEL DELIVERY Rack travel in m: 14.20...14.40 3rd speed rpm : 900 Rack travel in m: 13.60...13.80 Speed : 100 rom Del.quantity cm3/: 65.0...85.0 1000 s: (62.0...88.0) : 600 4th speed rpm Rack travel in m: 13.50...13.60 LOW IDLE Aneroid/Altitude Compensator Test Speed rpm : 325
Rack travel in mm : 7.50...7.70
Del.quantity cm3/ : 20.0...24.0
1000 s: (17.5...26.5) 1st version Setting cm3 : 3.50: 500 Spread Speed rpm 1000 s: (5.50) hPa : -Pressure : 10.40...10.50 Rack travel mm Remarks: Measurement 1/min: 500 Speed 1st pressure hPa : 450 Rack travel in m: 11.40...11.50 2nd pressure hPa : 700 Rack travel in m: 12.80...13.10 3rd pressure hPa : 1000 Rack travel in m: 13.50...13.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 : 1100 Speed rom

Note remarks

: VOL 4,5 Q Test sheet : 02.08.91 Edition

Replaces

: ISO-4113 Test oil

: 0 403 446 287 Combination no.

Injection pump

Pump designation : PES6MW100/320RS1219

: 0 413 406 209 EP type number

Governor

Governor design. : RQV350...1100MW118

: 0 420 083 249 Governer no.

Customer-spec. information Customer : VME

: TD 61 GB Engine

: 115.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 014 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 Prestroke mm : (2.95...3.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rom : 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 10.9...11.1

100 s: (10.7...11.3)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 6.3...6.5 Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1210 1st speed

: 9.50...9.90 rpm : 1150 travel mm

2nd speed

: 8.70...8.90 travel mm

rpm : 725 3rd speed

: 3.70...4.30 travel mm

rpm : 350 4th speed

: 1.20...1.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1000

Del.quantity : 109.0...113.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testina:

1st rack travel in: 10.40

**B18** 

rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm : 1200...1230 4th rack travel in: 1300 rpm : 0.10...1.00 Speed LOW IDLE 1 Control lever position degrees: 62...70 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 6.4 Testing: rpm : 100 Speed Minimum rack trave: 8.00 : 350 rpm Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 rpm : 460...520 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.40...11.40 2nd speed rpm : 700 Rack travel in m: 12.40...12.50 3rd speed rpm : 900 Rack travel in m: 11.90...12.20 Aneroid/Altitude Compensator Test 1st version Setting : 700 Speed rpm hPa : 450 Pressure : 11.80...11.90 Rack travel mm Measurement 1/min: 700 Speed 1st pressure hPa : -Rack travel in m: 10.20...10.30 2nd pressure hPa : 230 Rack travel in m: 10.70...11.00 3rd pressure hPa : 1000 Rack travel in m: 12.40...12.50 START CUT-OUT 1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 : 700 Speed rpm

Ç

**B19** 

Del.quantity cm3/: 120.5...123.5 1000 s: (118.0...126.0) cm3 : 3.50Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 700 Del.quantity cm3/: 82.0...84.0 1000 s: (80.0...86.0) RACK STOP ADJUSTMENT rpm : 100 Speed BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 90.0...110.0 1000 s: (87.0...113.0) Rack travel in mm : 19.00...21.00 LOW IDLE rpm : 350 Speed Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) cm3 : 3.50Spread 1000 s: (5.00) Remarks:

:

Note remarks

: IHC 7,6 X 4 : 23.08.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 403 446 288

Injection pump

Pump designation : PES6MW100/320RS1189

: 0 413 406 177 EP type number

Governor

Governor design. : RQV350...1200MW46-41

: 0 420 083 250 Governer no.

Customer-spec. information : NAVISTAR Customer

Engine : DTA-466

: 186.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar: 2.80

Test nozzle holder

: 1 688 901 101 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.25...3.35 Prestroke mm : (3.20...3.40)

Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 800 1st speed

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 15.2...15.4

100 s: (15.0...15.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed

: 9.80...10.20 rpm : 1250 travel mm

2nd speed

: 7.90...8.10 travel mm

rpm : 550 3rd speed

: 3.10...3.70 travel mm

: 350 4th speed rpm

: 1.30...1.70 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800 Aneroid pressure h: 1200

: 152.0...154.0 Del.quantity

1000 : (150.0...156.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 100...108 Testing: 1st rack travel in: 13.00 rpm : 1280...1300 Speed 2nd rack travel in: 4.00 rpm : 1435...1445 Speed 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 62...70 Setting point w/out bumper spring : 350 Speed Rack travel in mm: 5.4

Testing: rpm : 100 Speed Minimum rack trave: 9.00 rpm : 350 Speed Rack travel in mm : 5.30...5.50

CONSTANT REGULATION rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version Setting : 500 Speed rpm Pressure hPa : -

; 10.00...10.10 Rack travel mm

1/min: 500 Speed

1st pressure hPa : 245 Rack travel in m: 11.00...11.10

2nd pressure hPa : 560 Rack travel in m: 12.80...13.20

3rd pressure hPa : 1200

Rack travel in m: 14.00...14.10

START CUT-OUT

Measurement

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 1200 Speed rom

Del.quantity cm3/: 140.0...144.0

1000 s: (138.0...146.0)

cm3 : 6.50Spread 1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 77.0...79.0 1000 s: (75.0...81.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.00

rpm : 1280...1300 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm: 20.00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

: IHC #1816730C92

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before

shutoff.

Note remarks

: MB 6,1 B 6 : 26.07.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 403 446 289 Combination no.

Injection sump Pump designation : PES6MW100/720RS1131-

: 0 413 406 165 EP type number

Governor

Governor design. : RQV300...1300MW50-21

: 0 420 083 253 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M366LA Engine

: 177.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.60...3.70 Prestroke mm

: (3.55...3.75)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 13001st speed

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm : 6.3...6.5

Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed

: 9.00...9.40 travel mm rpm : 1350 2nd speed

: 8.10...8.30 travel mm

rpm : 650 3rd speed

: 4.70...5.30 travel mm

: 300 4th speed rpm

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed Aneroid pressure h: 1000

: 114.0...116.0 1000 : (112.0...118.0) cm3 : 3.50 Del.quantity

Spread 1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 116...124 Testing: 1st rack travel in: 13.40 rom : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1480...1510 Speed 4th rack travel in: 1600 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 78...86 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.4 Testing: Speed : 100 rpm Minimum rack trave: 9.00 rpm : 300 Speed Rack travel in mm : 6.30...6.50 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom Pressure hPa : : 10.60...10.70 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 200 Rack travel in m: 11.50...11.70 2nd pressure hPa : 400 Rack travel in m: 13.30...13.50 3rd pressure hPa : 1000 Rack travel in m: 14.40...14.50 START CUT-OUT 1/min: 180 (200) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 750 Del.quantity cm3/ : 106.5...109.5

1000 s: (104.0...112.0)

cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/ : 41.0...43.0
1000 s: (39.0...45.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0 1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Spread

Note remarks

: MAN 7,2 V Test sheet : 21.08.91 Edition : 06.91 Replaces : ISO-4113 Test oil

: 0 403 456 110 Combination no.

Injection pump

Pump designation : PES6MW100/321RS1201

: 0 413 406 190 EP type number

Governor

Governor design. : RQ250/1200MW84-3 : 0 420 082 043 Governer no.

: 3-7035 Cust. part no.

Customer-spec. information : MAN Customer

: D 0826 LF02 Engine

: 169.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 15.00...0.00 Firing order : 1-5-3-6-2-4

Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2) cm3 : 0.5 Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1300 1st speed : 8.40...8.80 travel mm

2nd speed rpm : 1260 travel mm : 6.60...6.80

3rd speed rpm : 345

: 4.00...4.60 travel mm

250 4th speed rom : 1.80...2.20

travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

rpm : 600 Speed Rack travel in mm : 18.20...19.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 137.0...141.0)

2nd pressure hPa : 550 : 3.50 cm3 Spread Rack travel in m: 11.90...12.20 1000 : (6.00) 3rd pressure hPa : 1000 Rack travel in m: 12.70...12.90 RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 92...100 1st version Aneroid pressure h: 1000 Setting point: Speed rpm : 600 Del.quantity cm3/: 137.0...140.0 Speed rom Rack travel in mm: 19.0 1000 s: (134.5...142.5) : 5.00 Spread cm3 Testing: 1000 s: (7.0) 1st rack travel in: 11.30 rpm : 1245...1260 Aneroid pressure h: 1000 Speed : 800 2nd rack travel in: 4.00 Speed rpm Speed rpm : 1300...1330 4th rack travel in: 1400 Speed Del.quantity cm3/: 140.0...143.0 1000 s: (137.5...145.5) Aneroid pressure h: 1000 Speed rpm : 1200 Del.quantity cm3/: 134.5...137.5 1000 s: (132.0...140.0) Speed rpm : 0.00...1.00LOW IDLE 1 Control lever Aneroid pressure h: position degrees: 69...77 Speed rpm : 500 Del.quantity cm3/ : 74.0...76.0 1000 s: (72.0...78.0) Setting point w/out bumper spring : 250 Speed rpm Rack travel in mm: 5.5 Testing: **BREAKAWAY** Speed rom Minimum rack trave: 7.00 Speed rpm : 250 Rack travel in mm : 5.40...5.60 1st version 1mm rack travel less than full load rack tr: 11.30 TORQUE CONTROL rpm : 1245...1260 Torque control curve - 1st version Speed 1st speed rpm : 1000 Rack travel in m: 12.50...12.60 STARTING FUEL DELIVERY nd speed rpm : 600 Rack travel in m: 12.70...12.90 2nd speed rpm : 800 rpm : 100 Speed 3rd speed rom Rack travel in m: 12.70...12.90 th speed rpm : 1200 Del.quantity cm3/: 60.0...80.0 1000 s: (57.0...83.0) 4th speed Rack travel in m: 12.20...12.40 LOW IDLE Aneroid/Altitude Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 16.0...20.0 Compensator Test 1000 s: (13.5...22.5) 1st version cm3 : 5.00 Setting Spread 1000 s: (7.00) nom : 500 hPa : 170 Speed CDW. Pressure : 10.20...10.30 Remarks: Rack travel mm : MAN #3-7047 Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 Measurement Speed  $1/\min : 500$ start of delivery 1st pressure hPa : -Rack travel in m: 10.00...10.10

Note remarks

: MAN 7,3 D Test sheet : 02.08.91 Edition : 05.91 Replaces

: ISO-4113 Test oil

: 0 403 456 115 Combination no.

Injection pump

Pump designation : PES6MW100/321RS1215

EP type number : 0 413 406 205

Governor

Governor design. : RQ250/1200MW84-7 : 0 420 082 055 Governer no.

Customer-spec. information Customer : MAN

: D 0826 LUH 01 Engine

: 199.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 : (3.45...3.65) Prestroke mm Rack travel in mm : 9.00...12.00

: 1-5-3-5-2-4 Firina order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 6.2...6.4 Del.quantity cm3/ : 2.1...2.5 100 s: (1.8...2.7)

cm3 : 0.3Spread 100 s: (0.5)

(3) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320 travel mm : 9.30...9.70

rpm : 1255 2nd speed

travel mm : 6.50...6.70 3rd speed rpn : 360

travel mm

: 3.90...4.50 : 250

4th speed rom : 1.60...2.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: 107 rpm : 600

Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000Speed Aneroid pressure h: 1200

: 163.0...165.0 Del.quantity

1000 : (161.0...167.0)

: 3.50 cm3 Spread 1000 : (6,00) RATED SPEED

1st version Control lever

position degrees: 94...102

Setting point:

Speed LDW Rack travel in mm: 20.0

Testing:

1st rack travel in: 12.60

rpm : 1245...1260 Speed

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 32...40 Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.3

Testing:

: 150 Speed mon Minimum rack trave: 8.00 rpm : 250

Rack travel in mm: 6.20...6.40

Aneroid/Altitude Compensator Test

1st version

Setting

rom : 500 hPa : 200 Speed rpm Pressure

Rack travel mm : 10.00...10.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.70...9.80

2nd pressure hPa : 700 Rack travel in m: 12.40...12.70

3rd pressure hPa : 1200

Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 600 Del.quantity cm3/: 167.0...170.0 1000 s: (164.5...172.5)

cmZ : 5.00Spread

1000 s: (7.0)

Aneroid pressure h: 1200 : 800 Speed rpm

Del.quantity cm3/: 163.0...166.0 1000 s: (160.5...168.5) Aneroid pressure h: 1200

Speed rpm : 1200 Del.quantity cm3/ : 160.0...163.0 1000 s: (157.5...165.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 77.0...79.0

1000 s: (75.0...81.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1245...1260 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 70.0...90.0 1000 s: (67.0...93.0)

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.20...6.40

Del.quantity cm3/: 21.0...25.0 1000 s: (18.5...27.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: MAN #3-7126

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAN 7,3 D 1 Test sheet : 02.08.91 Edition : 06.91 Replaces : ISO-4113 Test oil

Combination no. : 0 403 456 116

Injection pump

Pump designation : PES6MW100/321RS1215

: 0 413 406 205 EP type number

Governor

Governor design. : RQ250/1200MW84-7 : 0 420 082 055 Governer no.

Customer-spec. information : MAN Customer

: D 0826 LUH 04 Engine

: 199.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm : (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - " : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 10001st speed

Rack travel in mm: 13.60...13.70

Del.guantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 6.2...6.4 Del.quantity cm3/: 2.1...2.5 100 s: (1.8...2.7)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed : 9.30...9.70 travel mm

: 1255 2nd speed rpm : 6.50...6.70 travel mm

360 3rd speed rpm : 3.90...4.50 : 250 travel mm

4th speed rpm travel mm : 1.60...2.00

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

rpm : 600 Speed Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

rpm : 1000 Speed Aneroid pressure h: 1200

: 163.0...165.0 Del.quantity 1000 : (161.0...167.0)

: 3.50 cm3

1000 : (6.00) RATED SPEED

1st version

Control Lever

position degrees: 94...102

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testina:

1st rack travel in: 12.60

rpm : 1245...1260 Speed

2nd rack travel in: 4.00

Speed rpm: 1300...1330 4th rack travel in: 1400

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 32...40

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.3

Testing:

rpm : 150 Speed

Minimum rack trave: 8.00

Speed rpm : 250 Rack travel in mm : 6.20...6.40

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 Speed

hPa : 200 Pressure

: 10.00...10.10 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.70...9.80 2nd pressure hPa : 700

Rack travel in m: 12.40...12.70 3rd pressure hPa : 1200 Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 600 Speed rpm

Del.quantity cm3/: 167.0...170.0 1000 s: (164.5...172.5)

cm3 : 5.00Spread 1000 s: (7.0)

Aneroid pressure h: 1200

Speed rpm: 800
Del.quantity cm3/: 163.0...166.0
1000 s: (160.5...168.5)
Aneroid pressure h: 1200

Speed rpm : 1200 Del.quantity cm3/ : 160.0...163.0 1000 s: (157.5...165.5)

Aneroid pressure h: rpm\_ : 500 Speed

Del.quantity cm3/: 77.0...79.0

1000 s: (75.0...81.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.60

beed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 70.0...90.0 1000 s: (67.0...93.0)

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 21.0...25.0

1000 s: (18.5...27.5) cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

: MAN #3-7137

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAN 7,3 D 2 : 02.08.91 Test sheet Edition

: 06.91 Replaces : ISO-4113 Test oil

: 0 403 456 117 Combination no.

Injection pump

Pump designation : PES6MW100/321RS1215

: 0 413 406 205 EP type number

Governor

Governor design. : RQV250...1200MW83-2

: 0 420 083 216 Governer no.

Customer-spec. information Customer : MAN

Engine : D 0826 LF 04

: 199.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm : (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5- 3- 6- 2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 6.2...6.4

Del.quantity cm3/: 2.1...2.5

100 s: (1.8...2.7) cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1250 1st speed

: 10.60...11.00 travel mm

2nd speed rpm : 800

: 5.90...6.10 travel mm

rpm : 450 3rd speed

: 3.20...3.80 travel mm

rpm : 250 4th speed

: 1.20...1.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1200

: 163.0...165.0 Del.quantity

1000 : (161.0...167.0) cm3 : 3.50

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 300...308

CO2

Testing: 1st rack travel in: 12.60 rpm : 1250...1260 Speed 2nd rack travel in: 4.00 rpm : 1320...1350 Speed 4th rack travel in: 1400 : 0.00...1.00 Speed rpm LOW IDLE 1 Control lever position degrees: 256...264 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm: 6.3 Testing: : 150 Speed rpm Minimum rack trave: 8.00 rpm : 250 Speed Rack travel in mm : 6.20...6.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 200 Pressure Rack travel mm : 10.00...10.10 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.70...9.80 2nd pressure hPa : 700 Rack travel in m: 12.40...12.70 3rd pressure hPa : 1200 Rack travel in m: 13.60...13.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 600 Del.quantity cm3/: 167.0...170.0 1000 s: (164.5...172.5) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: 1200 : 800 Speed **Lbu** Del.quantity cm3/: 163.0...166.0 1000 s: (160.5...168.5) Ameroid pressure h: 1200 : 1200 Speed rpm Del.quantity cm3/: 160.0...163.0 1000 s: (157.5...165.5) Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 77.0...79.0 1000 s: (75.0...81.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.60 Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 70.0...90.0 1000 s: (67.0...93.0)

LOW IDLE

Remarks:

: MAN #3-7138

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: MWM 6,2 G Test sheet : 02.08.91 : 05.90 Edition Replaces : ISO-4113 Test oil

Combination no. : 0 403 466 108

Injection pump

Pump designation : PES6MW100/320/3RS116

: 0 413 406 149

EP type number

Governor

Governor design. : RSV325...1200MW0A326

: 0 420 085 085 Governer no.

Customer-spec. information : MWM Customer

: TD 226 B-6 Engine

1st version kW : 136.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 4.00...4.10 Prestroke mm

: (3.95.4.15)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 11.6...11.8

100 s: (11.4...12.0)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 325.0 Rack travel in mm : 6.5...6.7 Del.quantity cm3/: 0.8...1.2 100 s: (0.6...1.4)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...1.00

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 1200 Speed Aneroid pressure h: 700

Del.quantity : 170.9....120.5)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 90...98

Setting point:

Speed : 800 rom Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.40 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 : 1260...1300 Speed rpm 3rd rack travel in: 4.00 rpm : 1295...1325 Speed 4th rack travel in: 1380 rom : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 65...73 Setting point w/out bumper spring : 325 rom Rack travel in mm: 6.6 Testing: : 100 Speed rpm Minimum rack trave: 19.00 rpm : 325 Rack travel in mm : 6.50...6.70 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.40...10.50 rpm : 750 2nd speed Rack travel in m: 10.70...10.80 3rd speed rpm : 500 Rack travel in m: 10.70...10.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure : 8.50...8.60 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 270 Rack travel in m: 9.10...9.20 2nd pressure hPa : 450 Rack travel in m: 9.90...10.20 3rd pressure hPa : 700 Rack travel in m: 10.70...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 750 Del.quantity cm3/ : 116.5...119.5 1000 s: (114.0...122.0)

Spread cm3: 5.00 1000 s: (7.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 62.5...64.5 1000 s: (60.5...66.5)

### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.40 Speed rpm : 1240...1250

## STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (97.0...123.0) Rack travel in mm : 19.00...21.00

### LOW IDLE

### Remarks:

Test electrically-released starting quantity (EES) with 12 volts

Note remarks

: VOL 4,5 P Test sheet Edition : 26.07.91

Replaces : ISO-4113 Test oil

Combination no. : 0 403 474 015

Injection pump

Pump designation : PES4MW100/320RS1221

EP type number : 0 413 404 115

Governor

: RSV300...1000MW1A315 Governor design.

: 0 420 085 099 Governer no.

Customer-spec. information : VME Customer

: TD45B Engine

1st version kW : 84.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 10.5...10.7

100 s: (10.3...10.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm : 8.2...8.4 Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9) cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...1.00

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 105.0...107.0 Del.quantity 1000 : (103.0...109.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 11.40

: 1040...1050 rom Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 3rd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1200 rpm : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.7 Testing: rpm : 100 Speed Minimum rack trave: 19.00 Speed : 300 rom Rack travel in mm : 7.60...7.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1000 Del.quantity cm3/ : 106.5...109.5 1000 s: (104.0...112.0) cm3 : 5.50Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1040...1050 Speed STARTING FUEL DELIVERY : 100 Speed rom Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 300 Rack travel in mm : 8.20...8.40 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

Note remarks

Test sheet : MB 4,0 I 2 : 26.07.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 474 016

Injection pump

Pump designation : PES4MW100/720RS1212

EP type number : 0 413 404 114

Governor

Governor design. : RSV350...1300MW0A346

: 0 420 085 175 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M364LA Engine

: 102.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 13001st speed

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed Rack travel in mm : 6.0...6.8 Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6) cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.10...1.00

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

Aneroid pressure h: 700

Del.quantity : 101.0...103.0 1000 : (99.0...105.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm Rack travel in mm: 0.5

Testina:

1st rack travel in: 12.20

**CO8** 

rpm : 1340...1345 \* Speed

2nd rack travel in: 4.00

rpm : 1380...1393 Speed

3rd rack travel in: 4.00

Speed rpm : 1400...1430 4th rack travel in: 1500 Speed

rpm : 0.30...1.70 Speed 5th rack travel in: 1345...1360

Speed rpm : 12.20

LOW IDLE 1

Testina:

rom : 100 Speed Minimum rack trave: 19.00

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom

Pressure hPa :

: 10.10...10.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 200

Rack travel in m: 10.90...11.10

2nd pressure hPa : 400

Rack travel in m: 12.60...12.80

3rd pressure hPa : 700

Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 600 Del.quantity cm3/: 86.0...89.0

1000 s: (83.5...91.5)

cm3 : 5.00 Spread

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 36.0...38.0

1000 s: (34.0...40.0)

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 85.0...95.0 1000 s: (82.0...98.0)

LOW IDLE

**CO9** 

Speed : 350 rpm Rack travel in mm : 6.00...6.80

Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

Test sheet : MB 4.0 K Edition : 26.07.91

Replaces : -Test oil : ISO-4113

Combination no. : 0 403 474 017

Injection pump

Pump designation : PES4MW100/720RS1212-

EP type number : 0 413 404 118

Governor

Governor design. : RSV350...1300MW0A346

Governer no. : 0 420 085 176

Customer—spec. information Customer : MB-NFZ

Engine : 0M364LA

1st version kW : 102.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80 : (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 6.0...6.8 Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.10...1.00

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

Del.quantity : 101.0...103.0 1000 : (99.0...105.0)

cm3 : 3.50

1000 : (6.00)

RATED SPEED

Spread

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800 Rack travel in mm : 0.5 Testina:

1st rack travel in: 12.20

rpm : 1340...1345 \* Speed

2nd rack travel in: 4.00

rpm : 1380...1393 Speed

3rd rack travel in: 4.00

: 1400...1430 Speed rom

4th rack travel in: 1500

rpm : 0.30...1.70 Speed 5th rack travel in: 1345...1360 Speed rpm : 12.20

LOW IDLE 1

Testing:

Speed : 100 COM Minimum rack trave: 19.00

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed LDW.

hPa Pressure

: 10.10...10.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 200 Rack travel in m: 10.90...11.10

2nd pressure hPa : 400

Rack travel in m: 12.60...12.80

3rd pressure hPa : 700

Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

: 600 Speed rom

Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5) cm3 : 5.00

Spread

1000 s: (7.0)

Aneroid pressure h:

Speed rpm : 500 Del.quantity cm3/ : 36.0...38.0

1000 s: (34.0...40.0)

STARTING FUEL DELIVERY

: 100 Speed MCC

Del.quantity cm3/: 85.0...95.0 1000 s: (82.0...98.0)

LOW IDLE

: 350 Speed rpm

Rack travel in mm : 6.00...6.80

Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

: MB 4,0 H 6 Test sheet : 26.07.91 Edition

Replaces

: ISO-4113 Test oil

: 0 403 474 018 Combination no.

Injection pump

Pump designation : PES4MW100/720RS1151

EP type number : 0 413 404 104

Governor

: RSV350...1300MW0A346 Governor design.

: 0 420 085 177 Governer no.

Customer-spec. information Customer : MB-NFZ

Engine : 0M364A

: 79.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 8.2...8.4

100 s: (8.0...8.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 6.0...6.8 Del.quantity cm3/ : 1.0...1.4 100 s: (0.7...1.6) Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

Aneroid pressure h: 700

Del.quantity : 82.0...86.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm Rack travel in mm: 0.6

Testina:

1st rack travel in: 9.80

rpm : 1340...1345 \* Speed

2nd rack travel in: 4.00

rpm : 1380...1393 Speed 3rd rack travel in: 4.00 rpm : 1400...1430 Speed 4th rack travel in: 1550

: 0.30...1.70 Speed rpm 5th rack travel in: 1340...1350 rpm : 9.80 Speed

LOW IDLE 1

Testina: Speed : 100 rpm Minimum rack trave: 19.00 Rack travel in mm: 2.00

rpm : 420...500 Speed

TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1300

Rack travel in m: 10.80...10.90

2nd speed rpm : 600

Rack travel in m: 11.90...12.00

3rd speed rpm : 1000

Rack travel in m: 11.90...12.00

rpm : 1175 4th speed

Rack travel in m: 11.30...11.50

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm Pressure hPa : -

: 10.00...10.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 200

Rack travel in m: 10.70...10.90

2nd pressure hPa : 300

Rack travel in m: 11.20...11.40

3rd pressure hPa : 700

Rack travel in m: 11.90...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 600 rpm

Del.quantity cm3/: 75.0...78.0 1000 s: (72.5...80.5) cm3 : 5.00

Spread

1000 s: (7.0)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 46.0...48.0 1000 s: (44.0...50.0)

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0)

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 6.00...6.80 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

: LIE 8,4 D Test sheet : 26.07.91 Edition : 06.91 Replaces : ISO-4113 Test oil

: 0 403 476 081 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1196

: 0 413 406 184 EP type number

Governor

Governor design. : RSV350...1050MW0A338

: 0 420 085 138 Governer no.

Customer-spec. information : LIEBHERR Customer

: D 916 T Engine

: 170.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Overflow valve

: 1 417 413 049

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50

: (3.35...3.55)

Rack travel in mm : 9.00...12.00

Test oil

inlet temp. °C : 38...42

: 6.00x2.00x600 x Length mm

per values

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 10501st speed

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 13.3...13.5

100 s: (13.1...13.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed Rack travel in mm: 6.0...6.4

Del.guantity cm3/: 2.7...3.1 100 s: (2.4...3.3)

c.0 : Emp Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 750

: 133.0...135.0 1000 : (131.0...137.0) cm3 : 3.50 Del.quantity

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

: 800 Speed rom Rack travel in mm: 0.6

Testing:

1st rack travel in: 10.10

rom : 1060...1075 Speed 2nd rack travel in: 4.00 : 1115...1145 Speed rpm 3rd rack travel in: 4.00 : 1140...1170 rpm Speed 4th rack travel in: 1200 rpm : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 70...70 Testina: : 100 Speed rpm Minimum rack trave: 19.00 Aneroid/Altitude Compensator Test 1st version Setting : 550 Speed rom hPa : Pressure : 10.40...10.60 Rack travel mm Measurement 1/min: 550 Speed 1st pressure hPa : 350 Rack travel in m: 10.80...11.00 2nd pressure hPa : 750 Rack travel in m: 11.10...11.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 rpm : 500 Speed Del.quantity cm3/: 132.5...135.5 1000 s: (130.0...138.0) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: 750 Speed rpm : 800

Del.quantity cm3/: 133.5...136.5 1000 s: (131.0...139.0) Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/: 120.0...122.0 1000 s: (118.0...124.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

: 1060...1075 Speed rpm

STARTING FUEL DELIVERY

: 100 Speed rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

LOW IDLE

1000 s: (5.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Note remarks

: MB 6,0 D 92 : 26.07.91 Test sheet Edition

: 02.91 Replaces : ISO-4113 Test oil

Combination no. : 0 403 476 088

Injection pump

Pump designation : PES6MW100/720RS1144

EP type number : 0 413 406 138

Governor

: RSV350...1300MW0A341 Governor design.

: 0 420 085 146 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M366A Engine

: 125.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 10.70...10.80

Del.guantity cm3/: 7.2...7.4

100 s: (7.0...7.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.6 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 1300 Speed

: 72.0...74.0 Del.quantity

1000 : (70.0...76.0) cm3 : 3.50 1000 : (6.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rom Rack travel in mm: 0.6

Testina:

1st rack travel in: 9.70

: 1340...1345 \* Speed rpm

2nd rack travel in: 4.00

: 1380...1393 Speed rpm

3rd rack travel in: 4.00

: 1400...1430 Speed rpai

4th rack travel in: 1500

: 0.30...1.70 Speed ripm

5th rack travel in: 1345...1360 Speed rpm : 9.70

## LOW IDLE 1

Testing:

Speed : 100 **Lbu** Minimum rack trave: 19.00 Rack travel in mm : 2.00 : 445...505 Speed rom

TORQUE CONTROL

: 1.30 Dimension a mm

Torque control curve - 1st version

rpm : 1300 1st speed

Rack travel in m: 10.70...10.80

rpm : 700 2nd speed

Rack travel in m: 11.90...12.00

3rd speed rpm : 825

Rack travel in m: 11.60...11.80

## FUEL DELIVERY CHARACTERISTICS

1st version

: 700 Speed man

Speed rpm : 700 Del.quantity cm3/: 69.0...71.0 1000 s: (67.0...73.0)

Spread cm3 : 5.00

1000 s: (7.0)

Speed rpm: 825 Del.quantity cm3/: 73.0...76.0 1000 s: (70.5...78.5)

#### STARTING FUEL DELIVERY

mqn : 100 Speed

Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0)

# LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.00...7.60
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

: MB 6,0 D 93 : 26.07.91 Test sheet Edition

: 02.91 Replaces Test oil : ISO-4113

: 0 403 476 089 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1144

: 0 413 406 138 EP type number

Governor

: RSV350...1200MW0A341 Governor design.

: 0 420 085 147 Governer no.

Customer-spec. information Customer : MB-NFZ

: 0M366A Engine

: 115.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - \*

BASIC SETTING

rpm : 12001st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 8.0...8.2

100 s: (7.8...8.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.6 Del.quantity cm3/: 0.9...1.1

100 s: (0.6...1.4)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 3.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

: 80.5...82.5 Del.quantity 1000 : (78.5...84.5)

cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 99...107

Setting point:

Speed rpm Rack travel in mm: 0.6

Testing:

1st rack travel in: 11.00

: 1240...1245 \* Speed COM 2nd rack travel in: 4.00 rpm : 1285...1298 Speed 3rd rack travel in: 4.00 rpm : 1325...1355 Speed 4th rack travel in: 1450 rpm : 0.30...1.70 Speed 5th rack travel in: 1240...1255 rpm : 11.00 Speed LOW IDLE 1 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Rack travel in mm: 2.00 rpm : 445...505 Speed TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 12.00...12.10 2nd speed rpm : 750 Rack travel in m: 12.50...12.60 3rd speed rpm : 1000 Rack travel in m: 12.10...12.30 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750
Del.quantity cm3/: 74.5...76.5
1000 s: (72.5...78.5)
Spread cm3 : 5.00 1000 s: (7.0) STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 7.00...7.60 Del.quantity cm3/: 9.0...11.0 1000 s: (6.0...14.0) Spread cm3 : 3.50 1000 s: (5.50)

Add 45...53 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

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Remarks:

\* Read off speed set under 1.

Note remarks

Test sheet : MB 6,0 D 94 Edition : 26.07.91 Replaces : 02.91

Test oil : ISO-4113

Combination no. : 0 403 476 090

Injection pump

Pump designation : PES6MW100/720RS1144

EP type number : 0 413 406 138

Governor

Governor design. : RSV350...1200MW1A341

-3

Governer no. : 0 420 085 148

Customer-spec. information Customer : MB-NFZ

Engine : OM366A

1st version kW : 92.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65.,.3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 6.2...6.4

100 s: (6.0...6.6)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.6 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...1.00

Mack travec in this . Stock in .

Governor spring pre-tension Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1200

Del.quantity : 62.0...64.0 1000 : (60.0...66.8)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800 Rack travel in mm : 0.6

Testing:

1st rack travel in: 8.80

: 1235...1240 \* rom Speed 2nd rack travel in: 4.00

rpm : 1270...1283 Speed

3rd rack travel in: 4.00

Speed rpm : 1300...1330 4th rack travel in: 1450

Speed rpm : 0.30...1.70 5th rack travel in: 1245...1260

rpm : 8.80 Speed

# LOW IDLE 1

Testina:

: 100 Speed rpm Minimum rack trave: 19.00 Rack travel in mm : 2.00 : 415...475 Speed FIDM

TORQUE CONTROL

Dimension a mm : 0.70

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 9.80...9.90

2nd speed rpm : 800

Rack travel in m: 10.50...10.60

3rd speed rpm : 950

Rack travel in m: 10.10...10.30

## FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800 Del.quantity cm3/: 60.5...63.5

1000 s: (58.0...66.0)

cm3 : 5.00 Spread 1000 s: (7.0)

## STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0 1000 s: (75.0...91.0)

## LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.00...7.60
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

## Remarks:

\* Read off speed set under 1.

Add 35...43 min-1 to this speed. The

control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoif device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

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Note remarks

Test sheet : MB 6,0 D 95 Edition : 26.07.91 Replaces : 02.91

Test oil : ISO-4113

Combination no. : 0 403 476 091

Injection pump

Pump designation : PES6MW100/720RS1131

EP type number : 0 413 406 123

Governor

Governor design. : RSV350...1300MNOA342

Governer no. : 0 420 085 149

Customer—spec. information Customer : MB-NFZ

Engine: 0M 366 LA

1st version kW : 150.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80 : (3.65...3.85) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.9 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 1000

Del.quantity : 100.0...102.0 1000 : (98.0...104.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm: 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 11.60

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: 1340...1345 \* Speed COM

2nd rack travel in: 4.00

: 1387...1400 Speed COM

3rd rack travel in: 4.00

Speed rpm : 1420...1450 4th rack travel in: 1600

Speed rpm : 0.30...1.70 5th rack travel in: 1345...1355

rpm : 11.60 Speed

LOW IDLE 1

Testing:

: 100 Speed nom Minimum rack trave: 19.00 Rack travel in mm : 2.00 : 420...480 rom

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom hPa : -Pressure

: 10.70...10.80 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 250

Rack travel in m: 11.30...11.40

2nd pressure hPa : 400

Rack travel in m: 12.10...12.40 3rd pressure hPa : 1000

Rack travel in m: 12.60...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 Speed rpm : 600

Del.quantity cm3/: 86.5...89.5

1000 s: (84.0...92.0)

cm3 : 5.00 Spread

1000 s: (7.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 53.0...55.0 1000 s: (51.0...57.0)

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 83.0...93.0

1000 s: (80.0...96.0)

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 6.20...6.90

Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 47...55 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Test hydr. locking device for starting with 800...1200 hPa air pressure.

Note remarks

: MB 6,0 D 96 : 26.07.91 Test sheet Edition : 02.91 Replaces

: ISO-4113 Test oil

: 0 403 476 092 Combination no.

Injection pump

Pump designation : PES6NW100/720RS1120

: 0 413 406 112 EP type number

Governor

: RSV350...1300Mw0A342 Governor design.

: 0 420 085 150 Governer no.

Customer-spec. information : MB-NFZ Customer

: OM 366 LA Engine

: 142.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 13.00...13.10

Del.guantity cm3/: 9.5...9.7

100 s: (9.3...9.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed Rack travel in mm: 6.2...6.9

Del.quantity cm3/: 1.0...1.2 100 s: (0.6...1.5)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3
Speed rpm: 800
Rack travel in mm: 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

Aneroid pressure h: 1000

Del.quantity : 95.0....99.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Setting point:

กอสเ Rack travel in mm: 0.6

Testing:

1st rack travel in: 12.00

rpm : 1340...1345 \* Speed

2nd rack travel in: 4.00

rpm : 1397...1410 Speed 3rd rack travel in: 4.00 rpm : 1460...1490 Speed 4th rack travel in: 1600

rpm : 0.30...1.70Speed 5th rack travel in: 1335...1350 : 12.00 Speed rom

LOW IDLE 1

Testing:

Speed : 100 r:pm Minimum rack trave: 19.00 Rack travel in mm : 2.00 rpm : 420...480 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom Pressure hPa : -

: 11.60...11.70 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 300 Rack travel in m: 12.10...12.20

2nd pressure hPa : 360 Rack travel in m: 12.60...12.90

3rd pressure hPa : 1000

Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm\_ : 750 Speed

Del.quantity cm3/: 83.0...86.0 1000 s: (80.5...88.5)

cm3 : 5.00

Spread 1000 s: (7.0)

Aneroid pressure h: -: 500 Speed וווכרו

Del.quantity cm3/: 50.0...52.0 1000 s: (48.0...54.0)

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 85.0...95.0 1000 s: (92.0...98.0)

LOW IDLE

C25

Speed rpm : 350 Rack travel in mm : 6.20...6.90

Del.quantity cm3/: 10.0...12.0 1000 s: (6.5...15.5) Spread cm3: 3.50 1000 s: (5.00)

Remarks:

\* Read off speed set under 1. Add 57...65 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Test hydr. Locking device for starting with 800...1200 hPa air pressure.

Note remarks

: MB 6,1 B : 26.07.91 Test sheet Edition : 02.91 Replaces : ISO-4113 Test oil

: 0 403 476 097 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1131-

: 0 413 406 165 EP type number

Governor

Governor design. : RSV350...1300MW0A342

: 0 420 085 157 Governer no.

Customer—spec. information : MB-NFZ Customer

: 0M 366 LA Engine

1st version kW : 177.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.60...3.70 Prestroke mm : (3.55...3.75)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 15.60...15.70

Del.quantity cm3/: 12.0...12.2

100 s: (11.8...12.4)

cm3 : 0.3 Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.8 Del.quantity cm3/ : 1.0...1.2

100 s: (0.6...1.5)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

> Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

Aneroid pressure h: 1000

1000 : (118.0...124.0) Del.quantity

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Setting point:

Rack travel in mm: 0.6

Testing:

1st rack travel in: 14.60

: 1340...1345 \* rpm Speed 2nd rack travel in: 4.00 : 1432...1445 Speed rpm

3rd rack travel in: 4.00

: 1460...1490 Speed rpm 4th rack travel in: 1600 rpm : 0.30...1.70

Speed 5th rack travel in: 1340...1350 Speed rpm : 14.60

LOW IDLE 1

Testing:

rpm: Speed rpm : 100 Minimum rack trave: 19.00 Rack travel in mm : 2.00 rpm : 430...490 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 man Speed

hPa : -Pressure

: 10.70...10.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 270

Rack travel in m: 12.60...12.70
2nd pressure hPa : 500
Rack travel in m: 14.30...14.60
3rd pressure hPa : 1000

Rack travel in m: 15.60...15.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 : 600 Speed rpm

Del.quantity cm3/: 109.0...111.0 1000 s: (106.5...114.5)

cm3 : 5.00 Spread

1000 s: (7.0)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 31.0...33.0 1000 s: (29.0...35.0)

STARTING FUEL DELIVERY

Speed rpm

Del.quantity cm3/: 100.0...110.0 1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350 Rack travel in mm : 7.00...7.80

Del.quantity cm3/: 10.0...12.0 1000 s: (6.5...15.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 92...100 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure. Test hydr. Locking device for starting

with 800...1200 hPa air pressure.

Note remarks

Test sheet : MB 6,1 D 6 : 26.07.91 Edition : 03.91 Replaces Test oil : ISO-4113

Combination no. : 0 403 476 104

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

: RSV350...1200MW0A342 Governor design.

: 0 420 085 170 Governer no.

Customer spec. information Customer : MB-NFZ

: 0M 366 A Engine

: 100.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test Lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 7.4...7.6

100 s: (7.2...7.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 5.8...6.5 Del.quantity cm3/ : 0.9...1.3 100 s: (0.6...1.5) cm3 : 0.3

Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200 Aneroid pressure h: 750

Del.quantity : 74.0...76.0

1000 : (72.0...78.0) cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 96...104

Setting point:

Speed : 800 rpm Rack travel in mm: 0.6

Testing:

1st rack travel in: 9.50 rpm : 1240...1245 \* Speed 2nd rack travel in: 4.00 : 1280...1293 rpm Speed 3rd rack travel in: 4.00 : 1300...1330 Speed rpm 4th rack travel in: 1450 Speed rpm : 0.30...1.70 5th rack travel in: 1240...1255 rpm : 9.50 Speed LOW IDLE 1 Testing: : 100 Speed rpm Minimum rack trave: 19.00 Rack travel in mm : 2.00 rpm : 450...530 Speed TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 10.50...10.60 npm : 600 2nd speed Rack travel in m: 11.30...11.40 d speed rpm : 1000 3rd speed Rack travel in m: 10.90...11.10 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed man hPa : -Pressure : 10.00...10.10 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 250 Rack travel in m: 10.60...10.80 2nd pressure hPa : 300 Rack travel in m: 10.90...11.10 3rd pressure hPa : 750 Rack travel in m: 11.30...11.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 : 600 Speed rpm Del.quantity cm3/: 67.0...70.0 1000 s: (64.5...72.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -

001

Speed rpm : 500 Del.quantity cm3/ : 47.0...49.0 1000 s: (45.0...51.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 83.0...93.0 1000 s: (80.0...96.0)

#### LOW IDLE

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.
Test hydr. locking device for starting with 800...1200 hPa air pressure.

Note remarks

: MB 6,1 D 7 : 26.07.91 Test sheet Edition : 04.91 Replaces : ISO-4113 Test oil

: 0 403 476 105 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

: RSV350...1200MW0A342 Governor design.

: 0 420 085 171 Governer no.

Customer spec. information : MB-NFZ Customer

: 0M 366 A Engine

: 114.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 12001st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.02nd speed Rack travel in mm: 5.8...6.5 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm Aneroid pressure h: 756

: 84.0.... Del.quantity

1000 : (82.0...88.0) cm3 : 3.50 1000 : (6.00)

Spread

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

: 800 Speed rpm Rack travel in mm: 0.6

Testing:

1st rack travel in: 9.90 rpm : 1240...1245 \* Speed 2nd rack travel in: 4.00 rpm : 1285...1298 Speed 3rd rack travel in: 4.00

rpm : 1325...1355 Speed 4th rack travel in: 1450

rpm : 0.30...1.70 Speed 5th rack travel in: 1240...1255 : 9.90 Speed rom.

## LOW IDLE 1

Testing: : 100 Speed rpm Minimum rack trave: 19.00 Rack travel in mm : 2.00 rpm : 420...500 Speed

TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.90...11.00

2nd speed rpm : 600

Rack travel in m: 11.70...11.80
3rd speed rpm : 1000
Rack travel in m: 11.00...11.20

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm Pressure hPa : -

: 9.60...9.70 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 300

Rack travel in m: 10.70...10.90

2nd pressure hPa : 400

Rack travel in m: 11.30...11.50

3rd pressure hPa : 750

Rack travel in m: 11.70...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750 : 600 Speed rom

Del.quantity cm3/: 78.0...81.0 1000 s: (75.5...83.5)

cm3 : 5.00

Spread 1000 s: (7.0)

Aneroid pressure h: -

: 500 Speed rom

Del.quantity cm3/: 47.0...49.0 1000 s: (45.0...51.0)

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 83.0...93.0

1000 s: (80.0...96.0)

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.80...6.50 Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5)

Spread cm3 : 3.501000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 45...53 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.
Test hydr. locking device for starting with 800...1200 hPa air pressure.

D03

Note remarks

: MB 6,1 0 8 Test sheet : 26.07.91 Edition : 03.91 Replaces : ISO-4113 Test oil

: 0 403 476 107 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

: RSV350...1300Mw0A342 Governor design.

: 0 420 085 172 Governer no.

Customer-spec. information Customer : MB-NFZ

Engine : 0M 366 A

1st version kW : 122.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test Lines

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 5.8...6.5 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

cm3 : 0.3 100 s: (0.5) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rom : 800

Speed Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 750

Del.quantity : 84.0...88.0)

: 3.50 cm3Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800 Rack travel in mm : 0.6

Testing:

004

1st rack travel in: 9.90 rpm : 1340...1345 \* Speed 2nd rack travel in: 4.00 : 1380...1393 Speed r pm 3rd rack travel in: 4.00 rpm : 1400...1430 Speed 4th rack travel in: 1550 Speed rpm : 0.30...1.70 5th rack travel in: 1345...1360 Speed rpm : 9.90 LOW IDLE 1 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Rack travel in mm : 2.00 rpm : 420...500 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.90...11.00 : 600 2nd speed rpm Rack travel in m: 11.70...11.80 3rd speed rpm : 1100 Rack travel in m: 11.00...11.20 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure Rack travel mm : 10.30...10.40 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.70...10.90 2nd pressure hPa : 400 Rack travel in m: 11.30...11.50 3rd pressure hPa : 750 Rack travel in m: 11.70...11.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 : 600 Speed rpm Del.quantity cm3/: 78.0...81.0 1000 s: (75.5...83.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -

: 500

rom

Del.quantity cm3/: 47.0...49.0 1000 s: (45.0...51.0)

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 83.0...93.0 1000 s: (80.0...96.0)

LOW IDLE

Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.
Test hydr. locking device for starting with 800...1200 hPa air pressure.

Speed

Note remarks

Test sheet : CUM 8,3 u : 02.08.91 Edition : 16.1.91 Replaces Test oil : ISO-4113

: 9 400 087 449 Combination no.

Injection pump

Pump designation : PES6P120A320RS3264 : 9 400 087 075 EP type number

Governor

Governor design. : RQV350...1100PA973

: 9 420 080 293 Governer no.

Customer-spec. information : CUMMINS Customer

: 6 CTAA - 8.3 L Engine

: 216.6 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 915 Test Lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.45...3.55 Prestroke mm

: (3.40...3.60) Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 0.5...1.1

100 s: (0.3...1.3)

cm3 : 0.5Spread 100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1150 1st speed

7.00...7.10 travel mm

: 350 : 1.40...1.80 2nd speed rom travel mm

: 650 3rd speed rpm

: 4.30...4.70 travel mm

: 1400 4th speed rpm

: 8.80...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1325 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200

Del.quantity : 199.0...204.0)

cm3 : 5.00Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 106...114

Testing:

1st rack travel in: 10.50

rpm : 1160...1170 Speed

2nd rack travel in: 4.00

Speed rpm : 1330...1360 4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 66...74

Testina:

Speed man : 100 Minimum rack trave: 8.00 rpm : 350 Speed

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 425...575 Speed

Aneroid/Altitude Compensator Test

1st version

Setting : 500 Speed COM hPa : 1200 Pressure

: 11.50...11.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.90...9.10

2nd pressure hPa : 480

Rack travel in m: 9.60...9.70

3rd pressure hPa : 800

Rack travel in m: 10.70...11.00

START CUT-OUT

Speed 1/min: 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 700 Speed

Del.quantity cm3/: 204.0...208.0 1000 s: (200.5...211.5)

cm3 : 6.00Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 116.0...119.0

1000 s: (114.0...121.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 235.0...265.0

1000 s: (231.0...269.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 5.0...11.0
1000 s: (3.0...13.0)
Spread cm3 : 5.00

1000 s: (8.00)

Remarks:

Start-of-delivery mark is at 8° after start of delivery.

007

Note remarks

: MB 2,3 F : 14.10.91 Test sheet Edition : 24.02.89 Replaces : ISO-4113 Test oil

Combination no. : 0 400 074 087

Injection pump

Pump designation : PES4M55C32ORS175 EP type number : 0 410 054 957

Governor

: RSV350...1650M0c353-Governor design.

: 0 420 033 043 Governer no.

Customer-spec. information : MB-NFZ Customer

Engine : 0M601 (2,3L)

1st version kW : 51.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1630

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 4.0...4.1

100 s: (3.9...4.2)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.02nd speed Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 0.5...0.7

100 s: (0.4...0.9) cm3 : 0.1 Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1630 Speed

: 40.0...41.0 Del.quantity 1000 : (39.0...42.0)

: 2.50 Spread cm3 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11,2 Speed rpm : 1670...1680

2nd rack travel in: 4.00

Speed rpm : 1775...1793 4th rack travel in: 2000

rpm : 0.30...1.70Speed

800

LOW IDLE 1 Control Lever

position degrees: 17...25

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 5.4

Testina:

Speed rpm : 100 Minimum rack trave: 20.10

Speed rpm : 350 Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1630

Rack travel in m: 12.10...12.20

rpm : 1000 2nd speed

Rack travel in m: 12.60...12.80

3rd speed rpm : 1400

Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

: 1000 Speed rpm

Del.quantity cm3/: 38.5...40.0

1000 s: (37.5...41.0)

cm3 : 2.50Spread 1000 s: (3.0)

: 1400 Speed COM Del.quantity cm3/: 38.5...40.5

1000 s: (37.5...41.5) cm3 : 2.50 1000 s: (3.00)

Spread

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.2

rpm : 1670...1680 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0)

Rack travel in mm : 20.10...0.00

LOW IDLE

rpm : 350 Speed

D09

Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 5.0...7.0

1000 s: (4.5...9.0)

cm3 : 1.00 Spread 1000 s: (1.50)

Remarks:

Start-of-delivery sensor system:

adjustment and blocking with device KDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

Test sheet : MB 2,3 G1 Edition : 15.10.91

Replaces

Test oil : 150-4113

Combination no. : 0 400 074 088

Injection pump

Pump designation : PES4M55C32ORS175 EP type number : 0 410 054 957

Governor

Governor design. : RSV400...2000MDC353-

8

Governer no. : 0 420 033 044

Customer-spec. information Customer : MB-NFZ

Engine : 0M601 (2,3L)

1st version kW : 58.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 0-90-180-270

: 1-3-4-2

Tolerance + - °

Firing order

: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

Phasina

1st speed rpm: 1980

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 4.0...4.1

100 s: (3.9...4.2)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.7

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed rpm: 800 Rack travel in mm: 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1980

Del.quantity : 40.0...41.0

1000 : (39.0...42.0) cm3 : 2.50

Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 41...49

Testing:

1st rack travel in: 11.0

Speed rpm : 2020...2030

2nd rack travel in: 4.00

Speed rpm : 2130...2148

4th rack travel in: 2250

Speed rpm : 0.30...1.70

D10

LOW IDLE 1 Control lever

position degrees: 10...18

Setting point w/out bumper spring

rpm : 400 Rack travel in mm : 5.4

Testing:

Speed : 100 rpm Minimum rack trave: 20.10 : 400 Scred mqn

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1980 1st speed

Rack travel in m: 11.90...12.00

2nd speed

nd speed rpm : 500 Rack travel in m: 13.00...13.20

rpm : 1250 3rd speed

Rack travel in m: 12.70...12.90

rpm : 1500 4th speed

Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

: 500 Speed rpm

Del.quantity cm3/: 37.0...38.5 1000 s: (36.0...39.5)

cm3 : 2.50 1000 s: (3.0) Spread

: 1250 Speed rpm

Del.quantity cm3/: 39.0...41.0

1000 s: (38.0...42.0) cm3 : 2.50

Spread

1000 s: (3.00)

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm: 20.10...0.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm: 5.30...5.50 Del.quantity cm3/: 5.0...7.0 1000 s: (4.5...9.0)

cm3 : 1.00Spread

1000 s: (1.50)

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7°

(15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

: MB 2,3 n : 15.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 400 074 089 Combination no.

Injection pump

Pump designation : PES4M55C320RS175 : 0 410 054 957 EP type number

Governor

: RSV350...1500MOC353-Governor design.

10

: 0 420 033 039 Governer no.

Customer spec. information : MB-NFZ Customer

: 0M601 (2,3L) Engine

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1480 1st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 3.7...3.8

100 s: (3.6...3.9)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.5...0.7 100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm: 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1480 Speed

Del.quantity : 37.3...39.5)

1000 : (36.5...39.5)

1000 : (2.00)

1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: -

Testing:

1st rack travel in: 10.60 Speed rpm : 1520...1530

2nd rack travel in: 4.00

rpm : 1610...1628 Speed

4th rack travel in: 1750

rpm : 0.30...1.70Speed

D12

LOW IDLE 1 Control lever

position degrees: -

Setting point w/out bumper spring

Speed CDW Rack travel in mm: 5.4

Testing:

: 100 Speed rpm Minimum rack trave: 20.10 : 350 Speed rpm

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1480

Rack travel in m: 11.70...11.80

2nd speed rpm : 1100

Rack travel in m: 12.50...12.70

rpm : 1350 3rd speed

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

: 1100 Speed rpm

cm3 : 2.50 1000 s: (3.0) Spread

Speed rpm : 1350
Del.quantity cm3/ : 38.5...40.0
1000 s: (37.5...41.0)
Spread cm3 : 2.50
1000 s: (3.00)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.80

rpm : 1520...1530 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0)

Rack travel in mm : 20.10...0.00

**LOW IDLE** 

rpm : 350Speed

D13

Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 5.0...7.0 1000 s: (4.5...9.0)

cm3 : 1.00Spread 1000 s: (1.50)

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7°

(15.2...15.8°) angular displacement of cam following start of delivery of

cylinder no. 1.

Note remarks

: MB 2,3 n1 : 15.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 074 089

Injection pump

Pump designation : PES4M55C32ORS175 : 0 410 054 957 EP type number

Governor

: RSV350...1500M0c353-Governor design.

: 0 420 033 039 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M601 (2,3L) Engine

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening 1 contract 1 c

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

D14

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1480 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 3.7...3.8

100 s: (3.6...3.9)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.7

100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1480 Speed

: 37.5...38.5 Del.quantity

1000 : (36.5...39.5)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: -

Testing:

1st rack travel in: 10.80

rpm : 1520...1530 Speed

2nd rack travel in: 4.00

rpm : 1590...1620 Speed

4th rack travel in: 1750

rpm : 0.30...1.70Speed

LOW IDLE 1 Control lever

position degrees: -

Setting point w/out bumper spring

: 350 mon Rack travel in mm: 5.4

Testing:

Speed : 100 rpm Minimum rack trave: 20.10 : 350 Speed mqn.

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1480 1st speed

Rack travel in m: 11.70...11.80

: 1100 2nd speed rpm

Rack travel in m: 12.50...12.70

rpm : 1350 3rd speed

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100 Del.quantity cm3/: 39.0...40.0

1000 s: (38.0...41.0)

cm3 : 2.50 Spread 1000 s: (3.0)

: 1350 Speed rom

Del.quantity cm3/: 38.5...40.0

1000 s: (37.5...41.0)

cm3 : 2.50Spread

1000 s: (3.00)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.80

rpm : 1520...1530 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 52.0...0.0

1000 s: (52.0...0.0)

Rack travel in mm : 20.10...0.00

LOW IDLE

: 350 Speed LDW

D15

Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 5.0...7.0 1000 s: (4.5...9.0)

cm3 : 1.00Spread 1000 s: (1.50)

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7°

(15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

#### Note remarks

: MB 2,4 V11 Test sheet : 15.10.91 Edition

Replaces

: ISO-4113 Test oil

: 0 400 074 895 Combination no.

Injection pump

Pump designation : PES4M55C32ORS110 EP type number : 0 410 054 956

Governor

Governor design. : RSF375/1700M21-1

: 0 420 021 149 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M616 2.4L ADA Engine

1st version kW : 41.0

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 012

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85) Rack travel in mm : 20.00...0.00

Firing order : 1-3-4-

: 0-90-180-270 Phasing

Tolerance + - ° : 0.00 (1.00)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2 Spread

100 s: (0.3)

rpm : 375.0 2nd speed

Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 0.6...0.7

100 s: (0.5...0.9)

cm3 : 0.1 Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 31.5...32.5 Del.quantity

1000 : (30.5...33.5)

2.50 cm3 Spread 1000 : (3.00)

# RATED SPEED

1st version Control lever

position degrees: 50...0

3rd rack travel in: 6,8...7,2 Speed rpm : 1900

4th rack travel in: 2950

Speed : 0.00...1.00 rom

# SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000 Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

rpm : 375 Rack travel in mm: 6.1

Testing: Speed rpm : 250 Minimum rack trave: 10.00 rpm : 375 Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 Speed rpm : 700...800 : 1000 Speed rpm Maximum rack trave: 1.50 SET IDLE AUXILIARY SPRING rpm : 450 Speed Rack travel in mm : 5,1...5,3 : (5,0...5,4) TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.70...11.80 2nd speed rpm : 1400 Rack travel in m: 11.30...11.50 3rd speed rpm : 1700 Rack travel in m: 11.00...11.20 Aneroid/Altitude Compensator Test 1st version Setting : 1000 Speed rpm Pressure hPa : 950 : 0.00...0.20 Rack travel mm Measurement 1/min: 1000 Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 Speed : 1400 rpm Del.quantity cm3/: 33.0...34.5 1000 s: (32.0...35.5) cm3 : 2.50 Spread 1000 s: (3.0) Aneroid pressure h: 1100 Aneroid pressure 1: 1700
Speed rpm : 1700
Del.quantity cm3/: 33.0...35.0
1000 s: (32.0...36.0)
Spread cm3 : 2.50

1000 s: (3.00)

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm: 20.10...0.00

HIGH IDLE

1st version Aneroid pressure h: 1100

rpm : 1900 Speed Rack travel in mm : 6.80...7.20 Del.quantity cm3/ : 13.0...17.0 1000 s: (12.0...18.0)

cm3 : 2.50Spread 1000 s: (3.00)

LOW IDLE

rpm : 375 Speed Rack travel in mm : 6.00...6.20

Del.quantity cm3/: 6.0...7.0 1000 s: (5.5...9.0) Spread cm3 : 1.00 1000 s: (1.50)

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Note remarks

: MB 2,3 d : 14.10.91 Test sheet Edition : 17.07.89 Replaces : ISO 4113 Test oil

: 0 400 074 908 Combination no.

Injection pump

Pump designation: PES4M55C32ORS167 : 0 410 054 96^ EP type number

Governor

Governor design. : RSF375/2000M69 : 0 420 021 100 Governer no.

Customer-spec. information Customer : DB

: 0M601-2.3L Engine

: 60.0 1st version kW

TEST BENCH REGUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

: 1- 3- 4- 2 Firing order

: 0-90-180-270 Phasina Tolerance + - ° : 0.00(1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 4.0...4.1

100 s: (3.9...4.2)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 375
Rack travel in mm : 5.0...5.2
Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

Del.quantity : 40.0...42.0)

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7.0...7.5 Speed rpm : 2200

4th rack travel in: 2500

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER POSITION

rpm : 1000 Speed Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

rpm -Speed

Rack travel in mm : 5.1

1000 s: (38.5...42.5) Testing: cm3 : 2.50 Speed Spread rpm Minimum rack trave: 10.20 1000 s: (3.00) Speed rpm: 3.00 Speed rpm: 450...550 Aneroid pressure h: 1100 : 500 \* Speed וחמיז Del.quantity cm3/: 34.5...36.0 1000 s: (33.5...37.0) Spread cm3 : 2.50 : 1000 Speed rom Maximum rack trave: 1.50 1000 s: (3.00) Aneroid pressure h: 1100 : 800\*\* Speed SET IDLE AUXILIARY SPRING rpm Del.quantity cm3/: 37.5...39.0 1000 s: (36.5...40.0) rpm : 420 Speed Rack travel in mm: 3.9...4.1 : (3.8...4.2) cm3 : 2.50Spread 1000 s: (3.00) TORQUE CONTROL Torque control curve - 1st version : 1000 INTERMEDIATE RATED SPEED 1st speed rpm Rack travel in m: 12.80...12.90 : 1400 Control lever 2nd speed rom position degrees: 40.0...0.0 Rack travel in m: 12.20...12.50 Rack travel in mm : -(0.3): 2000 3rd speed rpm : 500 Rack travel in m: 11.40...11.70 Speed rom 4th speed rpm : 500 Rack travel in m: 12.10...12.40\* STARTING FUEL DELIVERY 5th speed rpm : 800 Rack travel in m: 12.40...12.70\*\* Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00) Aneroid/Altitude Compensator Test HIGH IDLE 1st version Setting : 1000 1st version Speed rpm Aneroid pressure h: 1100 hPa : 950 Pressure Speed rpm : 2200
Rack travel in mm : 7.00...7.50
Del.quantity cm3/: 22.00...26.00
1000 s: (21.00...27.00) : 0.00...0.20 Rack travel mm Measurement 1/min: 1000 Speed cm3 : 2.50 Spread 1000 s: (3.00) 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 LOW IDLE Rack travel in m: 1.80...2.20 Speed rpm : 375 Rack travel in mm: 5.00...5.20
Del.quantity cm3/: 5.0...6.0
1000 s: (4.5...9.0)
Spread cm3: 1.00 FUEL DELIVERY CHARACTERISTICS 1st version 1000 s: (1.50) Aneroid pressure h: 1100 : 1400 MC Del.quantity cm3/: 39.5...41.0 SETTING PNUEUMATIC FAST IDLE 1000 s: (38.5...42.0) (ELA) cm3 : 2.50 Spread 1000 s: (3.00) Aneroid pressure h: 1100 rpm : 425 Speed Rack travel in mm: 6.4...8.0 Speed : 2000 rpm

Del.quantity cm3/: 39.5...41.5

Del.quantity cm3/: -1000 s: (11.0...19.0)

Vacuum

hPa : 400

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

- \* Setting point for negative torque control negative retainer behind sliding sleeve
- \*\* Reference measurement: Control-rod travel and delivery too large - position spiral spring downwards Control-rod travel and delivery too small - position spiral spring upwards

Note remarks

Test sheet : MB 2,9 A : 15.10.91 Edition : 10.11.89 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 009

Injection pump

Pump designation : PES5M55C32ORS176 EP type number : 0 410 055 975

Governor

: RSV350...1650MOC353-Governor design.

: 0 420 033 042 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M602 (2,9L) Enaine

1st version kW : 62.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2,15)

Rack travel in mm : 20.00...22.00

: 1-2-4-5-3 Firing order

: 0-72-144-216-288 Phasina

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1630 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 4.0...4.1

100 s: (3.9...4.2)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.02nd speed Rack travel in mm : 5.3...5.5

Del.quantity cm3/: 0.5...0.7

100 s: (0.4...0.9) cm3 : 0.1Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1630 Speed

Del.quantity : 40.5...41.5 1000 : (39.5...42.5)

> Cm3 : 2.50

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 53...61

Testing:

1st rack travel in: 11,2 Speed rpm : 1670...1680 2nd rack travel in: 4.00

rpm : 1775...1793 Speed

4th rack travel in: 2000

rpm : 0.30...1.70Speed

LOW IDLE 1

Control lever

position degrees: 16...24

Setting point w/out bumper spring

: 350 rpm Speed Rack travel in mm : 5.4

Testina:

Speed rom! Minimum rack trave: 20.10 rpm : 350 Speed

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1630

Rack travel in m: 12.10...12.20

rpm : 1000 2nd speed

Rack travel in m: 12.90...13.10

3rd speed rpm : 1400

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 1000 rpm

Del.quantity cm3/: 40.0...41.5

1000 s: (39.0...42.5)

cm3 : 2.50Spread 1000 s: (3.0)

: 1400 Speed rpm

Del.quantity cm3/: 39.5...41.5 1000 s: (38.5...42.5)

cm3 : 2.50Spread

1000 s: (3.00)

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 52.0...0.0

1000 s: (52.0...0.0)

Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm: 350
Rack travel in mm: 5.30...5.50
Del.quantity cm3/: 5.0...7.0

1000 s: (4.5...9.0)

cm3 : 1.00Spread

1000 s: (1.50)

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

027

Note remarks

Test sheet : MB 2,9 B1 : 15.10.91 Edition

Replaces

: ISO-4113 Test oil

: 0 400 075 010 Combination no.

Injection pump

: PES5M55C32ORS176 Pump designation : 0 410 055 975 EP type number

Governor

Governor design. : RSV350...1500M0C353-

: 0 420 033 040 Governer no.

Customer-spec. information Customer : MB-NFZ

: 0M602 (2,9L) Engine

: 54.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-2-4-5-3

Phasing

: 0-72-144-216-288

Tolerance + - °

Firing order

: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1480

Rack travel in mm : 11.30...11.40

Del.guantity cm3/: 3.5...3.6

100 s: (3.4...3.7)

Spread

cm3 : 0.2

100 s: (0.3)

rpm : 350.02nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.5...0.7

100 s: (0.4...0.9) cm3 : 0.1 Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1480 Speed

: 35.0...36.0 Del.quantity 1000 : (34.0...37.0)

cm3

: 2.50 : (3.00) Spread 1000

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 10.40

rpm : 1520...1530 Speed

2nd rack travel in: 4.00

: 1610...1628 Speed rpm

4th rack travel in: 1750

rpm : 0.30...1.70 Speed

D23

LOW IDLE 1 Control lever

position degrees: 15...23

Setting point w/out bumper spring

rpm : 350 Speed Rack travel in mm: 5.4

Testing:

Speed : 100 rpm Minimum rack trave: 20.10 Speed rpm : 350

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1480 1st speed

Rack travel in m: 11.30...11.40

: 1000 2nd speed rpm

Rack travel in m: 12.50...12.70

3rd speed rpm : 1300

Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

: 1000 Speed rpm

Del.quantity cm3/: 38.0...39.5 1000 s: (37.0...40.5)

cm3 : 2.50 Spread

1000 s: (3.0)

Speed rpm : 1300 Del.quantity cm3/: 35.0...37.0

1000 s: (34.0...38.0) cm3 : 2.50

Spread 1000 s: (3.00)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.40

rpm : 1520...1530 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 52.0...0.0

1000 s: (52.0...0.0)

Rack travel in mm : 20.10...0.00

LOW IDLE

rpm : 350 Speed

D24

Rack travel in mm : 5.30...5.50
Del.quantity cm3/: 5.0...7.0
1000 s: (4.5...9.0)
Spread cm3 : 1.00

1000 s: (1.50)

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7°

(15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

: MB 2,9 B2 Test sheet : 15.10.91 Edition

Replaces

: ISO-4113 Test oil

: 0 400 075 011 Combination no.

Injection pump

Pump designation : PES5M55C32ORS176 EP type number : 0 410 055 975

Governor

: RSV400...2000MDC353-Governor design.

: 0 420 033 041 Governer no.

Customer-spec. information Customer : MB-NFZ

: 0M602 (2,9L) Engine

: 69.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test Lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-2-4-5-3 Firing order

: 0-72-144-216-288 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1980 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 3.9...4.0

100 s: (3.8...4.1)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 400.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.5...0.7 100 s: (0.4...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1980 Speed

: 39.5...40.5 Del.quantity 1000 : (38.5...41.5)

: 2.50 Spread cm3 : (3.00)

1000

RATED SPEED

1st version Control lever

position degrees: -

Testing:

1st rack travel in: 10.90

rpm : 2020...2030 Speed 2nd rack travel in: 4.00

Speed rpm : 2130...2148 4th rack travel in: 2250

: 0.30...1.70 Speed man

025

LOW IDLE 1 Control lever

position degrees: -

Setting point w/out bumper spring

rpm : 400° Speed Rack travel in mm: 5.4

Testing:

Speed rpm : 100 Minimum rack trave: 20.10 rpm : 400

Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1980 1st speed

Rack travel in m: 11.80...11.90 ad speed rpm : 750

2nd speed

Rack travel in m: 13.30...13.50 d speed rpm : 1500 Rack travel in m: 12.60...12.80

3rd speed

: 1650 4th speed rpm

Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Del.quantity cm3/: 39.0...40.0 1000 s: (38.0...41.0)

cm3 ; 2.50 Spread

1000 s: (3.0)

: 1500 Speed rpm

Del.quantity cm3/: 40.0...41.5

1000 s: (39.0...42.5)

cm3 : 2.50 Spread

1000 s: (3.00)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 2020...2030 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm: 20.10...0.00

LOW IDLE

026

rpm : 400 Speed

Rack travel in mm : 5.30...5.50

Del.quantity cm3/: 5.0...7.0

1000 s: (4.5...9.0) Spread

cm3 : 1.00 1000 s: (1.50)

Remarks:

Start-of-delivery sensor system:

adjustment and blocking with device KDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of

cylinder no. 1.

Note remarks

: Mb 2,5 H11 : 15.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 075 928

Injection pump

Pump designation : PES5M55C32ORS170 : 0 410 055 977 EP type number

Governor

Governor design. : RSF350/2300M71-4

: 0 420 021 164 Governer no.

Customer-spec. information : MB-PKW Customer

: 0M602-ECE MU90 ADA Engine

: 66.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-2-4-5-3 Firing order

: 0-72-144-216-288 Phasina

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 3.2...3.3

100 s: (3.1...3.4)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.02nd speed

Rack travel in mm: 6.5...6.7

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 32.0...33.0 Del.quantity 1000 : (31.0...34.0)

: 2.50 cm3 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

rpm

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER POSITION

: 1000 Speed rpm

Rack travel in mm: 1,2...1,3

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

D27

rpm : 350 Speed Rack travel in mm : 6.6 Testina: Speed rpm: 150
Minimum rack trave: 11.50
Speed rpm: 350
Rack travel in mm: 6.50...6.70
Rack travel in mm: 2.00 Speed rpm : 670...770 Spec rpm : 1000 Maximum rack trave: 1.30 SET IDLE AUXILIARY SPRING rpm : 400 Speed Rack travel in mm : 5,4...5,6 : (5,3...5,7) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.30...12.40 2nd speed rpm : 1800 Rack travel in m: 11.70...11.90 3rd speed rpm : 2200 Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version Setting rpm : 1000 hPa : 950 Speed Pressure Rack travel mm : 0.00...0.20 Measurement 1/min: 1000 Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100
Speed rpm : 1800
Del.quantity cm3/: 34.0...35.5
1000 s: (33.0...36.5)
Spread cm3 : 2.50
1000 s: (3.0)
Aneroid pressure h: 1100
Speed rpm : 2200 Speed rpm : 2200 Del.quantity cm3/: 34.0...36.0 1000 s: (33.0...37.0)

cm3 : 2.50Spread 1000 s: (3.00) STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version Aneroid pressure h: 1100 Speed rpm : 2500 Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) Spread cm3 : 2.50 1000 s: (3.00)

LOW IDLE

rpm : 350 Speed Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 5.0...6.0 1000 s: (4.5...9.0) cm3 : 1.00 Spread 1000 s: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed rpm : 400 Rack travel in mm : (6,8...8,4) Del.quantity cm3/: -1000 s: (6,0...14,0)

Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Engine with two-mass flywheel

Note remarks

: MB 2,5 W39 Test sheet : (8.10.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 075 929

Injection pump

Pump designation : PES5M55C32ORS177 EP type number : 0 410 055 974

Governor

Governor design. : RSF340/2300M64-18

: 0 420 021 159 Governer no.

Cust. part no. : T3

Customer-spec. information : MB-PKW Customer

: DM602A-USA Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina (

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order

: 1- 2- 4- 5- 3

: 0-72-144-216-288 Phasing

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.02nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0 1000 : (50.0...53.0)

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5..8,9 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rom

Rack travel in mm : 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.5  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.405.60 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 520620 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.7013.80 2nd speed rpm : 1600 Rack travel in m: 13.0013.20 3rd speed rpm : 2200 Rack travel in m: 12.2012.40 Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.508.90 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	+ LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Speed rpm: 315 Rack travel in mm: 5.405.60 Del.quantity cm3/: 5.06.0 1000 s: (4.08.5) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	# SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm: 340 Rack travel in mm: (12.714.1) Del.quantity cm3/:- 1000 s: (41.049.0) Current A: 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 49.551.0	Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0.01.0 Current short-duration A: 3.0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 52.0 1,8A

## Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.
0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to fullload stop; voltage value of 2.457... 2.517 V must be attained.

Note remarks

: MB 2,5 W40 Test sheet Edition : 11.10.91

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 075 930

Injection pump

Pump designation : PES5M55C32ORS177 : 0 410 055 974 EP type number

Governor

Governor design. : RSF340/2300M74-1 : 0 420 021 156 Governer no.

Cust. part no. : 13

Customer-spec. information : MB-PKW Customer

: 0M602A-D/A (KAT) Engine

: 92.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening.

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1 - 2 - 4 - 5 - 3

: 0-72-144-216-288 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 345.02nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.85)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...53.0)

: 2.50 cm3

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever position degrees: 50...0

3rd rack travel in: 8.5...8.9

rpm : 2500 Speed 4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER

POSITION

MCh Rack travel in mm: 1.7...1.8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.6	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050
Testing: Speed rpm : 150 Minimum rack trave: 11.00 Speed rpm : 345 Rack travel in mm : 5.505.70 Rack travel in mm : 2.50	Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 550650 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4.24.4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.7013.80 2nd speed rpm : 1600 Rack travel in m: 13.0013.20 3rd speed rpm : 2200 Rack travel in m: 12.2012.40 Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.508.90 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Speed rpm: 345 Rack travel in mm: 5.505.70 Del.quantity cm3/: 5.06.0 1000 s: (4.08.5) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 370 Rack travel in mm : (10,011.4) Del.quantity cm3/:- 1000 s: (27.535.5) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 49.551.0 1000 s: (48.552.0) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 2200	Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0.01.0 Current short-duration A: 3.0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 52,0 1.84

## Remarks:

Spring-retainer setting: at 1000 min-1 = 1.7...1.8 mm

Sliding sleeve pre-travel = 4.7 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) + Control lever on full-load stop. At n = 1000 min. -1, I = 2.5 A, difference in delivery referenced to full-load delivery (9.0...11.0) ccm/1000 strokes. +

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400 Receiving inspection Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter. Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

Note remarks

: MB 2,5 c7 Test sheet Edition : 08.10.91

Replaces : ISO-4113 Test oil

: 0 400 075 936 Combination no.

Injection pump

Pump designation : PES5M55C32ORS158 : 0 410 055 986 EP type number

Governor

Governor design. : RSF340/2300M64-14 : 0 420 021 142

Governer no.

: 13 Cust. part no.

Customer-spec. information : MB-PKW Customer

: OM602A-Abgast. Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

: 0-72-144-216-288 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.90...14.00

Del.guantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 315.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.55...0.65

100 s: (0.45...0.9)

cm3 : 0.1 Spread 100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1000 : (50.0...53.0) cm3 : 2.50 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

rpm : 2500 Speed 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rpm : 1000 Rack travel in mm: 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050
Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Speed rpm: 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3: 2.50 1000 s: (3.00)
Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm: 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm: 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 Rack travel in mm : 5.305.50 Del.quantity cm3/: 5.56.5 1000 s: (4.59.0) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/:- 1000 s: (41,049,0) Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A

## Remarks:

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Note remarks

: MB 2,5 C2 : 14.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 400 075 937 Combination no.

Injection pump

Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986

Governor

Governor design. : RSF340/2300M74 : 0 420 021 140 Governer no.

Cust. part no. : T3

Customer-spec. information Customer : MB-PKW

: OM6O2A-Abgast. Engine

: 92.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

: 1 680 750 014 Test Lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

: 0-72-144-216-288 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 345.02nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

Del.quantity : 51.0...53.0)

: 2.50 cm3 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed man

SET IDLE CONTROL LEVER

POSITION

: 1000 Speed rom Rack travel in mm : 1.7...1.8

LOW IDLE 1 Control Lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.4  Testing: Speed rpm : 150 Minimum rack trave: 11.00 Speed rpm : 345 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4.24.4 : (4.14.5)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator rest	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 345 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.06.0 1000 s: (4.08.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 370 Rack travel in mm : (10.011.4) Del.quantity cm3/: - 1000 s: (31,539,5) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/: min. 1000 s: 52.0 1.8A

## Remarks:

Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 345 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 ,
I = 2.5 A, difference in delivery referenced to full-load delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Spring-retainer setting: at 1000 min-1 = 1.7...1.8 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

Note remarks

: MB 2,5 C3 : 15.10.91 Test sheet : 13.11.89 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 938

Injection pump

Pump designation : PES5M55C32ORS170 EP type number : 0 410 055 977

Governor

Governor design. : RSF350/2300M71-3 : 0 420 021 136 Governer no.

Customer-spec. information : MB-PKW Customer

: OM602-ECE MJ90 ADA Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 : (1.95...2.15) Prestroke mm Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Edition

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Tolerance  $+ - ^{\circ} : 0.00 (1.00)$ 

Del.guantity cm3/: 3.2...3.3

100 s: (3.1...3.4)

: 0-72-144-216-288

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.02nd speed Rack travel in mm: 6.5...6.7

Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9) cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000Aneroid pressure h: 1100

: 32.0...33.0 Del.quantity

1000 : (31.0...34.0)

cm3 : 2.50 Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm : 1000 Rack travel in mm : 1,2...1,3

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

rpm : 350 Speed Rack travel in mm: 6.6 Testing: Speed : 150 rpm Minimum rack trave: 10,5+1 rpm : 350 Rack travel in mm: 6,5...6,7 Rack travel in mm : 2,0 Speed rpm : 670...770 : 1000 Speed rpm Maximum rack trave: 1.3 SET IDLE AUXILIARY SPRING rpm : 400 Speed Rack travel in mm : 5,4...5,6 : (5,3...5,7) TORQUE CONTROL Torque control curve - 1st version rom : 1000 1st speed Rack travel in m: 12.30...12.40 rpm : 1800 2nd speed Rack travel in m: 11.70...11.90 3rd speed rpm : 2200 Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1000 rpm Pressure hPa : 950 : 0.00...0.20 Rack travel mm Measurement  $1/\min : 1000$ Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 Speed rpm : 1800
Del.quantity cm3/: 34.0...35.5
1000 s: (33.0...36.5)
Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 34.0...36.0 1000 s: (33.0...37.0)

cm3 : 2.50 1000 s: (3.00) Spread STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 20.10...0.00 HIGH IDLE 1st version Aneroid pressure h: 1100 rpm : 2500 Speed Rack travel in mm: 8.50...8.90
Del.quantity cm3/: 22.0...26.0
1000 s: (21.0...27.0)
Spread cm3: 2.50 1000 s: (3.00) LOW IDLE Speed rpm: 350 Rack travel in mm: 6.50...6.70 Del.quantity cm3/: 5.0...6.0 1000 s: (4.5...9.0) cm3 : 1.00 Spread 1000 s: (1.50) SETTING PNUEUMATIC FAST IDLE (ELA) rpm : 400 Speed Rack travel in mm : (6,8...8,4) Del.quantity cm3/: -1000 s: (6,0...14,0) hPa : 400 Vacuum Remarks: CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar control rod must move briskly to

control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

Engine with two-mass flywheel

Spring-retainer setting: at 1000 min-1 = 1.2...1.3 mm

Note remarks

: MB 2,5 C4 Test sheet : 15.10.91 Edition : 13.11.89 Replaces Test oil : ISO-4113

Combination no. : 0 400 075 939

Injection pump

Pump designation : PES5M55C32ORS173 : 0 410 055 976 EP type number

Governor

Governor design. : RSF350/2300M71-2 : 0 420 021 135 Governer no.

Customer-spec. information : MB-PKW Customer

: OM602-Abgl. MJ90 ADA Engine

1st version kW : 64.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Firing order

: 0-72-144-216-288 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.40...12.50

Del.guantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.02nd speed Rack travel in mm: 6.4...6.6

Del.guantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 31.5...32.5 Del.quantity 1000 : (30.5...33.5)

: 2.50 Spread cm3

: (3.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9.1...9.5

rpm : 2500 Speed 4th rack travel in: 2950

Speed man : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

: 1000 Speed rpm Rack travel in mm: 1,4...1,5

LOW IDLE 1 Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 6.5 Testing: Speed rpm : 150 Minimum rack trave: 11.0+1 Speed rpm : 350
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.50 rpm : 600...700 Speed : 1000 Speed rpm Maximum rack trave: 1.50 SET IDLE AUXILIARY SPRING rpm : 400 Speed Rack travel in mm: 5,2...5,4 : (5,1...5,5) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.40...12.50
2nd speed rpm : 1800
Rack travel in m: 11.80...12.00
3rd speed rpm : 2200
Rack travel in m: 11.50...11.70 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1000 rpm Pressure hPa : 950 Rack travel mm : 0.00...0.20 Measurement 1/min : 1000 Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 FUEL DELIVERY CHARACTERISTICS 1st version Areroid pressure h: 1100
Speed rpm : 1800
Del.quantity cm3/: 34.5...36.0
1000 s: (33.5...37.0)
Spread cm3 : 2.50
1000 s: (3.0)
Aneroid pressure h: 1100
Speed rmm : 2200 Speed rpm : 2200 Del.quantity cm3/ : 33.0...35.0 1000 s: (32.0...36.0)

cm3 : 2.50 Spread 1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version Aneroid pressure h: 1100

Aneroid pressure ii. 100 Speed rpm : 2500 Rack travel in mm : 9.10...9.50 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0)

cm3 : 2.50 Spread 1000 s: (3.00)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.40...6.60
Del.quantity cm3/ : 5.0...6.0
1000 s: (4.5...9.0)
Spread cm3 : 1.00 1000 s: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

rpm : 400 Speed Rack travel in mm : (6,7...8,1) Del.quantity cm3/: -1000 s: (5,0...13,0) Vacuum hPa : 400

Remarks:

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

Engine with two-mass flywheel

Starting control-rod travel = 11.0...12.0 mm

Note remarks

: MB 2,5 C10 Test sheet Edition : 14.10.91

Replaces

Test oil : ISO-4113

: 0 400 075 944 Combination no.

Injection pump

Pump designation : PES5M55C32ORS177 : 0 410 055 974 EP type number

Governor

Governor design. : RSF340/2300M64-12

: 0 420 021 127 Governer no.

Cust. part no. : 13

Customer-spec. information Customer : MB-PKW

: 0M602A-USA MJ90 Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 : (1.65...1.85) Prestroke mm

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

: 0-72-144-216-288 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 315.0 2nd speed Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

: 51.0...52.0 1000 : (50.0...53.0) cm3 : 2.50 Del.quantity

Spread

1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8.5...8.9

: 2500 Speed rpm

4th rack travel in: 2950 : 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm Rack travel in mm: 1.7...1.8

LOW IDLE 1 Control lever

cm3 : 2.50Spread position degrees: 8...12 1000 s: (3.00) Setting point w/out bumper spring rpm : 315 Aneroid pressure h: 1050 Speed Rack travel in mm: 5.7 : 1000 Speed rpm Del.quantity cm3/: 33.0...34.0 1090 s: (32.0...35.0) Testina: cm3 : 2.50 rpm : 220 Spread Speed 1000 s: (3.00) Minimum rack trave: 8.00 rpm : 315 Speed Rack travel in mm : 5.60...5.80 STARTING FUEL DELIVERY : 1000 rom Maximum rack trave: 1.80 rpm : 100 SET IDLE AUXILIARY SPRING Speed Del.quantity cm3/ : 52.0...0.0 rpm : 380 Speed Rack travel in mm: 4.7...4.9 1000 s: (52.0...0.0) : (4.6...5.0) Rack travel in mm : 20.10...0.00 HIGH IDLE TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st version 1st speed Rack travel in m: 13.70...13.80 Aneroid pressure h: 1850 Speed rpm : 2500 rpm : 1600 2nd speed Rack travel in mm : 8.50...8.90 Rack travel in m: 13.00...13.20 Del.quantity cm3/: 29.0...33.0 3rd speed rpm : 2200 Rack travel in m: 12.20...12.40 1000 s: (28.0...34.0) cm3 : 2.50 Spread 1000 s: (3.00) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 315 Rack travel in mm : 5.60...5.80 1st version Setting Del.quantity cm3/ : 5.0...6.0 : 1000 Speed man 1000 s: (4.0...8.5) hPa : 1600 Pressure cm3 : 1.00: 0.30...0.70 Spread Rack travel mm 1000 s: (1.50) Measurement SETTING/TESTING ELECTRONIC IDLE 1/min : 1000 Speed REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.40...3.60 2nd pressure hPa : 750 Control lever at idle stop : 340 Rack travel in m: 4.90...5.30 Speed rpm Rack travel in mm : (12.6...14.0) Del.quantity cm3/: -FUEL DELIVERY CHARACTERISTICS 1000 s: (41.0...49.0) : 1.8 Current A 1st version Control lever at full-load stop Aneroid pressure h: 1850 : 2950 rom Speed Rack travel in mm : 0.0...1.0 Current short-duration A: 3.0 1000 s: (3.) Starting test Aneroid pressure h: 1850 Speed : 100 rpm Del.quantity cm3/: rpm\_ : 2200 Speed Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) 1000 s: 52.0 1,8A min. Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed

Adjustment of the control-rod travel sensor

on the digital voltmeter.

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

Note remarks

: MB 2,5 H4 : 15.10.91 Test sheet Edition : 17.02.89 Replaces : ISO-4113 Test oil

: 0 400 075 952 Combination no.

Injection pump

Pump designation : PES5M55C32ORS170 EP type number : 0 410 055 977

Governor

Governor design. : RSF350/2300M56-5 : 0 420 021 112 Governer no.

Customer spec. information : MB-PKW Customer

: 0M602-ECE ADA Engine

: 66.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Firing order

: 0-72-144-216-288 Phasina

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 3.2...3.3

100 s: (3.1...3.4)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.0 2nd speed Rack travel in mm: 6.5...6.7 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

cm3 : 0.1 Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1100
Del.quantity : 32.0...33.0
1000 : (31.0...34.0)
Spread cm3 : 2.50
1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9 Speed rpm : 2500

4th rack travel in: 2950

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER

**POSITION** 

Speed rpm Rack travel in mm: 1,2...1,3

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm: 6.6 Testing: Speed rpm Minimum rack trave: 9.50 Speed rpm : 350 Rack travel in mm : 6.50...6.70 Rack travel in mm : 2.00 : 670...770 Speed rpm rpm : 1000 Speed Maximum rack trave: 1.30 SET IDLE AUXILIARY SPRING : 400 rpm Speed Rack travel in mm: 5,4...5,6 : (5,3...5,7) TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1000

Rack travel in m: 12.30...12.40

nd speed rpm : 1800

Rack travel in m: 11.70...11.90 1st speed 2nd speed 3rd speed rpm : 2200 Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version hPa : 950 Pressure Rack travel mm : 0.00...0.20 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 Speed : 1800 rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/ : 34.0...36.0 1000 s: (33.0...37.0) cm3 : 2.50Spread

STARTING FUEL DELIVERY

1000 s: (3.00)

rom : 100 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1100
Speed rpm : 2500
Rack travel in mm : 8.50...8.90
Del.quantity cm3/: 22.0...26.0
1000 s: (21.0...27.0)
Spread cm3 : 2.50

1000 s: (3.00)

LOW IDLE

rpm : 350 Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 5.0...6.0 1000 s: (4.5...9.0) cm3 : 1.00Spread 1000 s: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

rpm : 400 Speed Rack travel in mm : (6.8...8.4) Del.quantity cm3/: -1000 s: (6,0...14,0) hPa : 400 Vacuum

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 350 1/min and pu = 450 mbarcontrol rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

Note remarks

: MB 2,9 D2 : 15.10.91 Test sheet Edition : 13.11.89 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 955

Injection pump

Pump designation : PES5M55C320RS168 EP type number : 0 410 055 978

Governor

Governor design. : RSF340/2000M70-2 : 0 420 021 107 Governer no.

Customer-spec. information Customer : MB-NFZ

: OM602-2.91 / ADA Engine

1st version kW : 72.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15) Rack travel in mm : 20.00...22.00

: 1-2-4-5-3 Firing order

: 0-72-144-216-288 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 3.8...3.9

100 s: (3.7...4.0)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.0 2nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1 100 s: (0.1) Spread

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 38.0...39.0 Del.quantity

1000 : (37.0...40.0) cm3 : 2.50 Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0
3rd rack travel in: 7,0...7,5

rpm : 2500 Speed 4th rack travel in: 2500

Speed : 0.00...1.00 rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 riom

Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 315 Rack travel in mm : 5.4	+ Speed rpm : 2000 + Del.quantity cm3/: 39.541.5 + 1000 s: (38.542.5)
Testing: Speed rpm : 250 Minimum rack trave: 7.00	+ Spread cm3 : 2.50 + 1000 s: (3.00) + Ameroid pressure h: 1100
Speed rpm : 315 Rack travel in mm : 5.305.50	Speed rpm : 500 * Del.quantity cm3/: 34.536.0 1000 s: (33.537.0)
Rack travel in mm : 2.50 Speed rpm : 500600 Speed rpm : 1000	+ Spread cm3 : 2.50 + 1000 s: (3.00)
Maximum rack trave: 1.50 SET IDLE AUXILIARY SPRING	Aneroid pressure h: 1100 Speed rpm: 800** Del.quantity cm3/: 36.538.0
Speed rpm : 380 Rack travel in mm : 4,04,2 : (3,94,3)	1000 s: (35.539.0) + Spread cm3 : 2.50 1000 s: (3.00)
TORQUE CONTROL Torque control curve - 1st version	INTERMEDIATE RATED SPEED
1st speed rpm : 1000 Rack travel in m: 12.5012.60 2nd speed rpm : 1400 Rack travel in m: 12.1012.40 3rd speed rpm : 2000	Control lever position degrees: 40.00.0 Rack travel in mm: -(0,3) Speed rpm: 500
Rack travel in m: 11.6011.90 4th speed rpm : 500 * Rack travel in m: 12.2012.40 5th speed rpm : 800**	STARTING FUEL DELIVERY
Rack travel in m: 12.3012.50  Aneroid/Altitude	Speed rpm : 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0)
Compensator Test	Rack travel in mm : 20.100.00
1st version Setting	+ HIGH IDLE + 1st version
Speed rpm : 1000 Pressure hPa : 950 Rack travel mm : 0.000.20	Aneroid pressure h: 1100 Speed rpm : 2200 Rack travel in mm : 7.007.50 Del.quantity cm3/: 22.026.0
Measurement Speed 1/min : 1000	1000 s: (21.027.0) - Spread cm3 : 2.50 1000 s: (3.00)
1st pressure hPa : 900 Rack travel in m: 0.500.70 2nd pressure hPa : 750	LOW IDLE
Rack travel in m: 1.802.20  FUEL DELIVERY CHARACTERISTICS	
1st version	1000 s: (4.59.0) Spread cm3 : 1.00 1000 s: (1.50)
Aneroid pressure h: 1100 Speed rpm : 1400 Del.quantity cm3/: 38.039.5 1000 s: (37.040.5)	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1100	Control lever at idle stop Speed rpm : 340

Rack travel in mm : (11,6...13,0)

Del.quantity cm3/: -1000 s: (29,0...37,0)

: 1,8 Current A

Control lever at full-load stop

rpm : 2500 Speed Rack travel in mm: 0,0...1,0

Current

short-duration A: 3.0

Starting test

rpm : 100 Speed

Del.quantity cm3/: -min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

- \* Setting point for negative torque control - negative retainer behind sliding sleeve
- \*\* Reference measurement: Control-rod travel and delivery too large - position spiral spring downwards Control-rod travel and delivery too small - position spiral spring upwards

Note remarks

: MB 2,9 03 Test sheet : 15.10.91 Edition : 06.10.89 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 956

Injection pump

Pump designation : PES5M55C32ORS168 : 0 410 055 978 EP type number

Governor

Governor design. : RSF350/1900M69-3 Governer no. : 0 420 021 104

Customer-spec. information Customer : MB-NFZ

: 0M602-2.91 / ADA Engine

: 70.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-Firing order

: 0-72-144-216-288 Phasing

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 10001st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 3.8...3.9

100 s: (3.7...4.0)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1100

: 38.0...39.0 Del.quantity 1000 : (37.0...40.0) cm3 : 2.50

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7,0...7,5

rpm : 2100 Speed

4th rack travel in: 2500

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER POSITION

rpm : 1000 Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm: 350 Rack travel in mm: 5.3  Testing: Speed rpm: 250 Minimum rack trave: 9.20 Speed rpm: 350 Rack travel in mm: 5.205.40 Rack travel in mm: 3.00 Speed rpm: 470570 Speed rpm: 1000 Maximum rack trave: 1.50  SET IDLE AUXILIARY SPRING Speed rpm: 380 Rack travel in mm: 4,24,4 : (4,14,5)	Speed rpm: 1900 Del.quantity cm3/: 39.541.5 1000 s: (38.542.5) Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1100 Speed rpm: 500 * Del.quantity cm3/: 34.536.0 1000 s: (33.537.0) Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1100 Speed rpm: 800** Del.quantity cm3/: 36.538.0 1000 s: (35.539.0) Spread cm3: 2.50 1000 s: (35.539.0)
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.5012.60 2nd speed rpm : 1400 Rack travel in m: 12.1012.40 3rd speed rpm : 1900 Rack travel in m: 11.6011.90 4th speed rpm : 500 * Rack travel in m: 12.2012.40 5th speed rpm : 800** Rack travel in m: 12.3012.50 Aneroid/Altitude Compensator Test	INTERMEDIATE RATED SPEED  Control lever position degrees: 400 Rack travel in mm: -(0,3) Speed rpm: 500  STARTING FUEL DELIVERY  Speed rpm: 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm: 20.100.00
1st version Setting Speed rpm : 1000 Pressure hPa : 950 Rack travel mm : 0.000.20  Measurement Speed 1/min : 1000  1st pressure hPa : 900 Rack travel in m: 0.500.70 2nd pressure hPa : 750 Rack travel in m: 1.802.20  FUEL DELIVERY CHARACTERISTICS	HIGH IDLE   1st version   Aneroid pressure h: 1100   Speed   rpm   : 2100   Rack travel in mm : 7.007.50   Del.quantity cm3/ : 22.026.0   1000 s: (21.027.0)   Spread   cm3   : 2.50   1000 s: (3.00)   LOW IDLE   Speed   rpm   : 350   Rack travel in mm : 5.205.40   Del.quantity cm3/ : 5.06.0   1000 s: (4.59.0)   Spread   cm3   : 1.00
1st version Aneroid pressure h: 1100 Speed rpm : 1400 Del.quantity cm3/ : 38.039.5 1000 s: (37.040.5) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1100	Spread cm3 : 1.00 1000 s: (1.50)  SETTING PNUEUMATIC FAST IDLE (ELA)  Speed rpm : 400 Rack travel in mm : (5,26,8

Del.quantity cm3/: -1000 s: (5.0...13,0)

Vacuum

hPa : 400

Remarks:

Sliding sleeve pre-travel = 6.25 mm

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 350 1/min and pu = 450 mbarcontrol rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device LDEP 1077 = 15.3°...15.7° (15.2...15.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

- \* Setting point for negative torque control - negative retainer behind sliding sleeve
- \*\* Reference measurement: Control-rod travel and delivery too large - position spiral spring downwards Control-rod travel and delivery too small - position spiral spring upwards

Note remarks

: MB 3.0 W37 Test sheet : 14.10.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 076 956

Injection pump

Pump designation : PES6M55C32ORS181 EP type number : 0 410 056 983

Governor

Governor design. : RSF305/2125M64-20

: 0 420 021 168 Governer no.

Customer-spec. information : MB-PKW Customer

: 0M603A D35 USA Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm : (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 5.9...6.0

100 s: (5.8...6.1)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 280.0 2nd speed

Rack travel in mm : -

Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9) cm3 : 0.1 100 s: (0.1) Spread

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1900

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9.2...9.6

Speed rpm : 2500 4th rack travel in: 2700

: 0.00...1.00 Speed **MOW** 

SET IDLE CONTROL LEVER

**POSITION** 

: 1000 Speed rpm

Rack travel in mm: 1,9...2,0

LOW IDLE 1 Control lever

position degrees: 8...12

Setting point w/out bumper spring

F04

Spread cm3 : 2.50morn : 280 Speed 1000 s: (3.00) Testina: : 200 Speed rpm Minimum rack trave: 8.00 STARTING FUEL DELIVERY rpm : 1000 Speed Maximum rack trave: 2.00 Speed rpm : 100 Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) SET IDLE AUXILIARY SPRING rpm : 400 Speed Rack travel in mm : 20.10...0.00 Rack travel in mm: 4.3...4.5 : (4.2...4.6) HIGH IDLE TORQUE CONTROL Torque control curve - 1st version 1st version 1st speed rpm : 1000 Aneroid pressure h: 1900 : 2300 Rack travel in m: 14.10...14.20 rpm Rack travel in mm : 9.20...9.60 2nd speed rpm : 1600 Rack travel in m: 13.20...13.20

3rd speed rpm : 2000

Rack travel in m: 12.20...12.50 Del.quantity cm3/: 37.0...41.0 1000 s: (36.0...42.0) cm3 : 2.50 Spread 1000 s: (3.00) Aneroid/Altitude LOW TOLE Compensator Test rpm : 280 Speed Rack travel in mm : -1st version Del.quantity cm3/: 5.5...6.5 Setting 1000 s: (5.0...9.5) : 1000 Speed man cm3 : 1.00 Pressure hPa : 1600 Spread 1000 s: (1.50) : 0.80...1.20 Rack travel mm SETTING/TESTING ELECTRONIC IDLE Measurement REGULATION (ELR) 1/min: 1000 Speed 1st pressure hPa : 1050 Control lever at idle stop Rack travel in m: 3.70...3.90 rpm : 305 2nd pressure hPa : 750 Rack travel in mm : (11.5...12.9) Rack travel in m: 5.20...5.60 Del.quantity cm3/: -1000 s: (41.0...49.0) FUEL DELIVERY CHARACTERISTICS Current A Control lever at full-load stop 1st version : 2700 Speed Aneroid pressure h: 1900 rpm Rack travel in mm: 0.0...1.0 : 1600 rpm Del.quantity cm3/: 56.5...58.0 Current 1000 s: (55.5...59.0) short-duration A: 3,0 cm3 : 2.50Starting test Spread : 100 1000 s: (3.0) Speed rpm Del.quantity cm3/: -min. 1000 s: 52.0 Aneroid pressure h: 1900 1.8A : 2000 Speed rpm Del.quantity cm3/: 54.0...56.0 1000 s: (53.0...57.0) Remarks: : 2.50 cm3 Spread 1000 s: (3.00) Aneroid pressure h: 1050 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF Speed : 1000 rpm -Control-lever position 35,5°, max. Del.quantity cm3/: 38.0...39.0 0.2 mm control-rod travel deduction 1000 s: (37.0...40.0)

allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.487...2.547
(2.457...2.577) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487... 2.547 V must be attained.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

: MB 3.0 W42 : 15.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 400 076 957 Combination no.

Injection pump

Pump designation : PES6M55C32ORS171 : 0 410 056 989 EP type number

Governor

Governor design.: RSF315/2300M72-5

: 0 420 021 165 Governer no.

Customer-spec. information Customer : MB-PKW

: 0M603-ECE MJ90 / ADA Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test Lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 300.02nd speed Rack travel in mm: 6.8...7.0 Del.quantity cm3/:0.6...0.7

100 s: (0.6...1.0)

cm3 : 0.1 Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000Speed

Aneroid pressure h: 1100

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rpm : 1000 Speed

Rack travel in mm : 1,2...1,3

LOW IDLE 1 Control lever

position degrees: 12...16

Setting point w/out bumper spring

F07

Speed rpm : 300 Rack travel in mm : 6.9 cm3 : 2.50 Spread 1000 s: (3.00) Testing: STARTING FUEL DELIVERY Speed rpm : 220 Minimum rack trave: 8.50 rpm : 300 Rack travel in mm : 6.80...7.00
Rack travel in mm : 2.00
Speed rpm : 620...720 Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00 Speed rpm : 1000 Maximum rack trave: 1.30 HIGH IDLE SET IDLE AUXILIARY SPRING rpm : 360 1st version Speed Rack travel in mm: 5,3...5,5 : (5,2...5,6) Aneroid pressure h: 1100 Speed rpm : 2500 Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) TORQUE CONTROL Torque control curve - 1st version cm3 : 2.50 1000 s: (3.00) rpm : 1000 Spread 1st speed Rack travel in m: 12.00...12.10
2nd speed rpm : 1400
Rack travel in m: 11.80...12.00
3rd speed rpm : 2200
Rack travel in m: 11.50...11.70 LOW IDLE Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 6.5...7.5 1000 s: (6.0...10.5) Spread cm3 : 1.00 1000 s: (1.50) Aneroid/Altitude Compensator Test 1st version SETTING/TESTING ELECTRONIC IDLE Setting REGULATION (ELR) : 1000 Speed rpm hPa : 950 Pressure Rack travel mm : 0.00...0.20 Control lever at idle stop Speed rpm : 315 Measurement Rack travel in mm : (12,0...13,4) 1/min: 1000 Speed Del.quantity cm3/: -1000 s: (27,0...35,0) 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 : 1.8 Current A Control lever at full-load stop Rack travel in m: 1.80...2.20 rpm : 2950 Rack travel in mm: 0,0...1.0 FUEL DELIVERY CHARACTERISTICS Current short-duration A: 3,0 Starting test 1st version rpm : 100 Speed Aneroid pressure h: 1100 Del.quantity cm3/: -min. 1000 s: 52,0 : 1400 Speed rpm Del.quantity cm3/: 31.0...32.5 1000 s: (30.0...33.5) 1,8A cm3 : 2.50 Remarks: Spread 1000 s: (3.) Aneroid pressure h: 1100 Sliding sleeve pre-travel = 6.5 mm Speed rpm : 2200 Del.quantity cm3/: 34.0...36.0 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF 1000 s: (33.0...37.0) -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 300 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

Note remarks

: MB 3.0 W38 Test sheet : 14,10,91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 076 958

Injection pump

Pump designation : PES6M55C32ORS181 : 0 410 056 983 EP type number

Governor

Governor design. : RSF315/2125M64-19

: 0 420 021 162 Governer no.

Customer-spec. information : MB-PKW Customer

: 0M603A D35 USA Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test Lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rom: 1000 1st speed

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 5.9...6.0

100 s: (5.8...6.1)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed

Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.95)

cm3 : 0.1 Spread 100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1900

Anerold pressure n: 1900 Del.quantity : 59.0...60.0 1000 : (58.0...61.0) Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 50...0 3rd rack travel in: 9.2...9.6

rpm : 2300 Speed 4th rack travel in: 2700

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm : 1000 Speed

Rack travel in mm: 1.9...2.0

LOW IDLE 1 Control Lever

position degrees: 8...12

Setting point w/out bumper spring

F10

Del.quantity cm3/: 38.0...39.0 1000 s: (37.0...40.0) Speed rpm : 290 Rack travel in mm : 5.6 cm3 : 2.50 Spread 1000 s: (3.00) Testing: : 200 Speed rpm Minimum rack trave: 8.00 : 1000 STARTING FUEL DELIVERY rom Maximum rack trave: 2.00 rpm : 100 SET IDLE AUXILIARY SPRING Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) rpm : 400 Speed Rack travel in mm: 4.3...4.5 : (4.2...4.6) Rack travel in mm : 20.10...0.00 HIGH IDLE TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st version 1st speed Rack travel in m: 14.10...14.20 Aneroid pressure h: 1900 Speed rpm : 2300 Rack travel in mm : 9.20...9.60 2nd speed rpm : 1600 Rack travel in m: 13.20...13.20 Del.quantity cm3/: 37.0...41.0 1000 s: (36.0...42.0) 3rd speed rpm : 2000 Rack travel in m: 12.20...12.50 : 2.50 Spread cm31000 s: (3.00) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 290
Rack travel in mm : 5.50...5.70
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) 1st version Setting : 1000 Speed man hPa : 1600 Pressure cm3 : 1.00 Spread : 0.80...1.20 Rack travel mm 1000 s: (1.50) Measurement SETTING/TESTING ELECTRONIC IDLE 1/min: 1000 Speed REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.70...3.90 2nd pressure hPa : 750 Control lever at idle stop Speed rpm : 315 Rack travel in mm : (11.5...12.9) Rack travel in m: 5.20...5.60 Del.quantity cm3/: -1000 s: 41.0...49.0) FUEL DELIVERY CHARACTERISTICS Current A 1st version Control lever at full-load stop Aneroid pressure h: 1900 rpm : 1600 rpm : 2700 Speed Del.quantity cm3/: 56.5...58.0 1000 s: (55.5...59.0) Spread cm3 : 2.50 1000 s: (3.0) Rack travel in mm: 0.0...1.0 Current short-duration A: 3.0 Starting test rpm : 100 Aneroid pressure h: 1900 Speed Del.quantity cm3/: min. 1000 s: 52.0 : 2000 Speed rpm Del.quantity cm3/: 54.0...56.0 1.8A min. 1000 s: (53.0...57.0) cm3 : 2.50 Remarks: Spread 1000 s: (3.00) CHECKING THE IDLE-SPEED AUXILIARY Aneroid pressure h: 1050 SPRING CUTOFF : 1000 Speed rom -Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.487...2.547
(2.457...2.577) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487... 2.547 V must be attained.

Note remarks

: MB 3.0 W39 : 14.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 400 076 959 Combination no.

Injection pump

Pump designation : PES6M55C32ORS180 : 0 410 056 984 EP type number

Governor

Governor design. : RSF315/2300M64-17

: 0 420 021 157 Governer no.

Customer-spec. information Customer : MB-PKW

: 0M603A-D/A (KAT) Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke am

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm : 10001st speed

Rack travel in mm: 13.70...13.80

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm: 5.4...5.6 Del.guantity cm3/: 0.5...0.6

100 s: (0.5...0.95)

cm3 : 0.1Spread 100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

Del.quantity : 31.0...53.0)

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.4...8.8 rpm : 2500 Speed

4th rack travel in: 2950 rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER

POSITION

Speed rom : 1000 Rack travel in mm: 1.7...1.8

LOW IDLE 1 Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290 Rack travel in mm : 5.5  Testing: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.405.60 Rack travel in mm : 2.50	+++++++++++++++++++++++++++++++++++++++	Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm: 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3: 2.50 1000 s: (3.00)
Speed rpm : 520620 Speed rpm : 1000 Maximum rack trave: 1.80	†	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4.24.4 : (4.14,5)	++++++	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.7013.80 2nd speed rpm : 1600 Rack travel in m: 13.0013.20 3rd speed rpm : 2200 Rack travel in m: 12.2012.40 Aneroid/Altitude Compensator Test	┉╇╌╊╌╂╌╂┄╂┄┼╌╱╍╂╸╂╴╂╾╀┈╄╼┨	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.408.80 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)  LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	+++++++++	Speed rpm : 290 Rack travel in mm : 5.405.60 Del.quantity cm3/: 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000 1st pressure hPa: 1050	†	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	-+-+-+-+-+-+-+-+-+-	Control Lever at idle stop Speed rpm : 315 Rack travel in mm : (13.114.5) Del.quantity cm3/: - 1000 s: (43.051.0) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	<del>+++++++++++++++++++++++++++++++++++++</del>	Control lever at full-load stop Speed rpm : 100 Rack travel in mm : 0 J1.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 52.0 1.8
	+	Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Adjustment of the control-rod travel

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

Note remarks

: MB 3,0 W46 : 16.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 400 076 960 Combination no.

Injection pump

Pump designation : PES6M55C32ORS179 : 0 410 056 985 EP type number

Governor

Governor design: : RSF315/2000M65-16

: 0 420 021 158 Governer no.

Customer-spec. information

: MB-PKW Customer

: 0M603A D35 GW / ALDA Engine

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 014 Test Lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm : (1.65...1.85)

Rack travel in mm : 20.00...22.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 5.6...5.7

100 s: (5.5...5.8)

cm3 : 0.2 Spread

100 s: (0.3)

rpm : 290.02nd speed Rack travel in mm : 5.7...5.9

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1900

Del.quantity : 50.5...58.5)

cm3 : 2.50 Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7,2...7,6 Speed rpm : 2300

Speed 4th rack travel in: 2700

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER

**POSITION** 

rpm : 1000

Rack travel in mm: 1,9...2,0

LOW IDLE 1 Control lever

position degrees: 8...12

Setting point w/out bumper spring

F16

Speed rpm: 290 Rack travel in mm: 5.8  Testing: Speed rpm: 200 Minimum rack trave: 7.00 Speed rpm: 290 Rack travel in mm: 5.705.90 Rack travel in mm: 3.00 Speed rpm: 500600 Speed rpm: 1000 Maximum rack trave: 2.00	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/ : 38.039.0 1000 s: (37.040.0) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 'Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100  Del.quantity cm3/: 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.6013.70 2nd speed rpm : 1600 Rack travel in m: 12.5012.70 3rd speed rpm : 2000 Rack travel in m: 11.6011.80  Aneroid/Altitude Compensator Test	HIGH IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.801.20	Speed rpm : 290 Rack travel in mm : 5.705.90 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000  1st pressure hPa: 1050	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.303.50 2nd pressure hPa : 750 Rack travel in m: 4.805.20 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (11,813,2) Del.quantity cm3/: 1000 s: (43,550,5) Current A : 1,8
1st version Aneroid pressure h: 1900 Speed rpm : 1600 Del.quantity cm3/ : 52.554.0	Control lever at full-load stop Speed rpm : 2700 Rack travel in mm : 0.01.0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A Remarks:

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

SPRING CUIDFF
-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

: MB 3,0 W45 : 16.10.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 076 960

Injection pump

Pump designation : PES6M55C32ORS179 : 0 410 056 985 EP type number

Governor

Governor design. : RSF315/2000M65-6 : 0 420 021 161 Governer no.

Customer-spec. information : MB-PKW Customer

: OM603A D35 GW / ALDA Engine

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.60...13.70

Del.guantity cm3/: 5.6...5.7

100 s: (5.5...5.8)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm : 5.7...5.9 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1 Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1900

Del.quantity

: 56.5...57.5 1000 : (55.5...58.5)

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7,2...7,6 Speed rpm : 2300

4th rack travel in: 2700

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm Rack travel in mm: 1,9...2,0

LOW IDLE 1

Control Lever

position degrees: 8...12

Setting point w/out bumper spring

F19

Speed rpm: 290 Rack travel in mm: 5.8  Testing: Speed rpm: 200 Minimum rack trave: 7.00 Speed rpm: 290 Rack travel in mm: 5.705.90 Rack travel in mm: 3.00 Speed rpm: 500600 Speed rpm: 1000 Maximum rack trave: 2.00	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 38.039.0 1000 s: (37.040.0) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4,24,4 : (4,14,5)	- Speed rpm : 100 - Del.quantity cm3/ : 52.00.0 - 1000 s: (52.00.0) - Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.6013.70 2nd speed rpm : 1600 Rack travel in m: 12.5012.70 3rd speed rpm : 2000 Rack travel in m: 11.6011.80  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1900 Speed rpm : 2300 Rack travel in mm : 7.307.40 Del.quantity cm3/: 25.529.5 1000 s: (24.530.5) Spread cm3 : 2.50 1000 s: (3.00)
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.801.20	- Speed rpm : 290 - Rack travel in mm : 5.705.90 - Del.quantity cm3/ : 5.56.5 - 1000 s: (5.09.5) - Spread cm3 : 1.00 - 1000 s: (1.50)
Measurement Speed 1/min: 1000  1st pressure hPa: 1050	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.303.50 2nd pressure hPa : 750 Rack travel in m: 4.805.20 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm: 315 Rack travel in mm: (11,813,2) Del.quantity cm3/: - 1000 s: (43,550,5) Current A: 1,8
1st version Aneroid pressure h: 1900 Speed rpm : 1600 Del.quantity cm3/: 52.554.0	Control lever at full-load stop Speed rpm: 2700 Rack travel in mm: 0.01.0 Current short-duration A: 3,0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A Remarks:

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.
0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

#### Note remarks

: MB 3.0 W27 : 15.10.91 Test sheet Edition : 19.07.89 Replaces : ISO-4113 Test oil

: 0 400 076 961 Combination no.

Injection pump

Pump designation : PES6M55C32ORS157-1 : 0 410 056 991 EP type number

Governor

Governor design. : RSF315/2300M65-5 Governer no. : 0 420 021 145

Customer-spec. information : MB-PKW Customer

: OM603A-ECE Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm : (2.15...2.35)

Rack travel in mm : 20.00...22.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm: 290.0 Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1000 : (50.0...53.0) cm3 : 2.50 1000 : (3.60) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

Speed rpm Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290 Rack travel in mm : 5.4	+ Spread cm3 : 2.50 + 1000 s: (3.00) + Aneroid pressure h: 050
Testing: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Speed rpm: 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3: 2.50 1000 s: (3.00)
Speed rpm : 510610 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)  LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 290 Rack travel in mm: 5.305.50 Del.quantity cm3/: 5.56.5 1000 s: (5.09.5) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000  1st pressure hPa: 1050	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop  Speed rpm : 315  Rack travel in mm : (12,614,0)  Del.quantity cm3/: -  1000 s: (41,049,0)  Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0,01,0 Current short-duration A: 3,0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

### Note remarks

: MB 3.0 W28 Test sheet : 14.10.91 Edition : 19.07.89 Replaces : ISO-4113 Test oil

: 0 400 076 962 Combination no.

Injection pump

Pump designation : PES6M55C32ORS157 : 0 410 056 993 EP type number

Governor

Governor design. : RSF315/2300M64-15 : 0 420 021 143 Governer no.

Customer-spec. information : MB-PKW Customer

: OM603A-Abgast. Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening .

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 : (2.15...2.35) Prestroke mm

Rack travel in mm : 20.00...22.00 Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2 Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.95)

cm3 : 0.1 Spread 100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity 1000 : (50.0...53.0)

: 2.50 cm3 Spread 1000 : (3.00)

RATED SPEED

1st version Control Lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER POSITION

: 1000 rpm Rack travel in mm: 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm: 290 Rack travel in mm: 5.4  Testing: Speed rpm: 200 Minimum rack trave: 7.00 Speed rpm: 290 Rack travel in mm: 5.305.50 Rack travel in mm: 2.50 Speed rpm: 510610 Speed rpm: 1000	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/ : 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
Maximum rack trave: 1.80  SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4.24.4 : (4.14.5)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)  LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 290 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000 1st pressure hPa: 1050	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.614.0) Del.quantity cm3/: - 1000 s: (41.049.0) Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5  1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 2200 Del.quantity cm3/: 48.550.5 1000 s: (47.551.5)	Control lever at full-load stop Speed rpm : 100 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 1.8A  Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 2.472... 2.532 V must be attained.

Note remarks

: Mb 3.0 W37 : 16.10.91 Test sheet Edition : 14.11.89 Replaces : ISO-4113 Test oil

: 0 400 076 963 Combination no.

Injection pump

Pump designation : PES6M55C32ORS157-1

EP type number : 0 410 056 991

Governor

Governor design. : RSF450/2300M68-1 : 0 420 021 141 Governer no.

Customer-spec. information : MB-NFZ Customer

: 0M603A (3.0L) Engine

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)
Rack travel in mm : 20.00...22.00
Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 4.6...4.7

100 s: (4.5...4.8)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 450.02nd speed Rack travel in mm: 5.4...5.6

Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

Spread cm3: 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

: 46.5...47.5 Del.quantity 1000 : (45.5...48.5)

: 2.50 cm3 Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,4...8,8 Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER **POSITION** 

rpm Rack travel in mm: 1,9...2,0

LOW IDLE 1 Control lever

position degrees: 10...14

Setting point w/out bumper spring

cm3 : 2.50Spread Speed והסרו 1000 s: (3.00) Rack travel in mm: 5.5 Aneroid pressure h: 1050 Speed rpm : 1000

Del.quantity cm3/: 34.0...35.0

1000 s: (33.0...36.0)

Spread cm3 : 2.50 Testing: Speed rom Minimum rack trave: 12.50 : 450 rpm Speed 1000 s: (3.00) Rack travel in mm : 5.40...5.60 Rack travel in mm: 2.50 : 620...720 Speed rpm : 1000 STARTING FUEL DELIVERY Speed rom Maximum rack trave: 2.00 Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00 SET IDLE AUXILIARY SPRING rpm : 500 Speed Rack travel in mm: 4,3...4,5 : (4,2...4,6) HIGH IDLE TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 13.10...13.20 and speed rpm : 1600 Rack travel in m: 12.40...12.60 Aneroid pressure h: 1850 Speed rpm : 2500
Rack travel in mm : 8.40...8.80
Del.quantity cm3/ : 29.0...33.0
1000 s: (28.0...34.0) 2nd speed 3rd speed rpm : 2200 Rack travel in m: 11.50...11.70 cm3 : 2.50 Spread 1000 s: (3.00) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 450
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) 1st version Setting : 1000 Speed rpm hPa : 1500 Pressure cm3 : 1.00 Spread : 0.00...0.40 Rack travel mm 1000 s: (1.50) Measurement SETTING PNUEUMATIC FAST IDLE 1/min: 1000 Speed (FLA) 1st pressure hPa : 1050 Rack travel in m: 2.70...2.90 Speed rpm : 500 Rack travel in mm : (6,8...8,4) 2nd pressure hPa : 750 Rack travel in m: 4.40...4.80 Del.quantity cm3/: -1000 s: (14,0...22.0) FUEL DELIVERY CHARACTERISTICS hPa : 600 Vacuum Remarks: 1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 45.5...47.0 Sliding sleeve pre-travel = 6.5 mm CHECKING THE IDLE-SPEED AUXILIARY 1000 s: (44.5...48.0) SPRING CUTOFF cm3 : 2.50Spread -Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction 1000 s: (3.0) Aneroid pressure h: 1850 allowable after switchover point (of rpm : 2200 Speed Del.quantity cm3/: 44.0...46.0 1000 s: (43.0...47.0) starting cam) up to 1000 1/min. -Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Note remarks

: MB 3.0 W29 : 16.10.91 Test sheet Edition : 06.10.89 Replaces : ISO-4113 Test oil

: 0 400 076 964 Combination no.

Injection pump

Pump designation : PES6M55C32ORS171 EP type number : 0 410 056 989

Governor

: RSF315/2300M72-4 Governor design. : 0 420 021 138 Governer no.

Customer-spec. information : MB-PKW Customer

: 0M603-ECE MJ90 / ADA Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10 : (1.95...2.15) Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 300.0 2nd speed Rack travel in mm: 6.8...7.0 Del.quantity cm3/: 0.6...0.7

100 s: (0.6...1.0) cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

Aneroid P. Del. quantity 1000 : 31.0...32.0

1000 : (30.0...33.0) cm3 : 2.50 1000 : (3.00)

Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0
3rd rack travel in: 8,5...8,9
Speed rpm : 2500

4th rack travel in: 2950 : 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER

**POSITION** 

: 1000 Speed rpm Rack travel in mm: 1,2...1,3

LOW IDLE 1 Control lever

position degrees: 12...16

Setting point w/out bumper spring

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cm3 : 2.50rpm : 300 Speed Spread 1000 s: (3.00) Rack travel in mm: 6.9 Testing: STARTING FUEL DELIVERY : 220 Speed **CDW** Minimum rack trave: 8.50 : 300 rpm rpm : 100 Rack travel in mm : 6.80...7.00 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 2.00 Speed : 620...720 rpm Rack travel in mm : 20.10...0.00 : 1000 Speed rpm Maximum rack trave: 1.30 HIGH IDLE SET IDLE AUXILIARI UNIXIONIS Speed rpm : 360 Rack travel in mm : 5,3...5,5 : (5,2...5,6) SET IDLE AUXILIARY SPRING 1st version Aneroid pressure h: 1100 rpm : 2500 Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 22.0...26.0 TORQUE CONTROL 1000 s: (21.0...27.0) cm3 : 2.50 Torque control curve - 1st version rpm : 1000 1st speed Spread 1000 s: (3.00) Rack travel in m: 12.00...12.10 : 1400 2nd speed rpm Rack travel in m: 11.80...12.00 LOW IDLE 3rd speed rpm : 2200 rpm : 300 Rack travel in m: 11.50...11.70 Speed Rack travel in mm: 6.80...7.00 Del.quantity cm3/: 6.5...7.5 Areroid/Altitude 1000 s: (6.0...10.5) Compensator Test cm3 : 1.00Spread 1000 s: (1.50) 1st version SETTING/TESTING ELECTRONIC IDLE Setting : 1000 REGULATION (ELR) Speed rom hPa : 950 Pressure Rack travel mm : 0.00...0.20 Control lever at idle stop rpm : 315 Speed Measurement Rack travel in mm : (12,0...13,4) 1/min: 1000 Speed Del.quantity cm3/: -1000 s: (27,0...35,0) 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Current A 2nd pressure hPa : 750 Control lever at full-load stop Rack travel in m: 1.80...2.20 : 2950 Speed COM Rack travel in mm : 0.0...1.0 FUEL DELIVERY CHARACTERISTICS Current short-duration A: 3.0 Starting test 1st version Aneroid pressure h: 1100 Speed rpm : 1400 Del.quantity cm3/: 31.0...32.5 1000 s: (30.0...33.5) : 100 Speed rpm Del.quantity cm3/: -min. 1000 s: 52,0 1,8A min. cm3 : 2.50Remarks: Spread 1000 s: (3.0) Sliding sleeve pre-travel = 6.5 mm Aneroid pressure h: 1100 rpm : 2200 Speed Del.quantity cm3/: 34.0...36.0 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF 1000 s: (33.0...37.0) -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 300 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

Test sheet : MB 3.0 W30 : 15,10,91 Edition

Replaces

: ISO-4113 Test oil

: 0 400 076 965 Combination no.

Injection pump

Pump designation : PES6M55C32ORS174 : 0 410 056 988 EP type number

Governor

Governor design. : RSF315/2300M72-3 Governor no. : 0 420 021 137

Governer no.

Customer-spec. information : MB-PKW **Customer** 

: OM603-Abal. MJ90/ADA Engine

1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test Lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm : (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-5- 3- 6- 2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rom : 10001st speed

Rack travel in mm : 12.40...12.50

Del.guantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.0...7.2

Del.quantity cm3/: 0.6...0.7 100 s: (0.6...1.0)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

Del.quantity : 31.5...32.5 1000 : (30.5...33.5)

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9.1...9,5

Speed : 2500 rpm 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000 Rack travel in mm : 1.4...1.5

LOW IDLE 1 Control lever

position degrees: 12...16

Setting point w/out bumper spring

606

Speed rpm : 300 Rack travel in mm : 7.1 cm3 : 2.50 Spread 1000 s: (3.00) Testing: Speed rpm : 220 Minimum rack trave: 7.00 STARTING FUEL DELIVERY : 300 rpm rpm : 100 Rack travel in mm : 7.00...7.20 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 2.50 rpm : 600...700 Speed Rack travel in mm : 20.10...0.00 rpm : 1000 Speed Maximum rack trave: 1.50 HIGH IDLE SET IDLE AUXILIARY SPRING rpm : 360 1st version Aneroid pressure h: 1100 Speed rpm : 2500 Rack travel in mm : 9.10...9.50 Del.quantity cm3/ : 22.0...26.0 1000 s: (21.0...27.0) Rack travel in mm : 5,3...5,5 : (5.2...5.6) TORQUE CONTROL Torque control curve - 1st version cm3 : 2.50 1st speed rpm : 1000 Spread 1000 s: (3.00) Rack travel in m: 12.40...12.50 2nd speed rpm : 1800
Rack travel in m: 11.80...12.00
3rd speed rpm : 2200
Rack travel in m: 11.50...11.70 LOW IDLE Speed rpm : 300 Rack travel in mm : 7.00...7.20 Del.quantity cm3/: 6.5...7.5 1000 s: (6.0...10.5) Spread cm3 : 1.00 1000 s: (1.50) Aneroid/Altitude Compensator Test 1st version SETTING/TESTING ELECTRONIC IDLE Setting : 1000 REGULATION (ELR) Speed rpm hPa : 950 Pressure : 0.00...0.20 Rack travel mm Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.8...14.2) Measurement 1/min: 1000 Speed Del.quantity cm3/: -1000 s: (28.0...36.0) Current A : 1.8 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Current A 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0.0...1.0 FUEL DELIVERY CHARACTERISTICS Current short-duration A: 3.0 Starting test 1st version Aneroid pressure h: 1100 Speed rpm : 1800 Del.quantity cm3/: 34.5...36.0 1000 s: (33.5...37.0) Spread cm3 : 2.50 rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 52.0 1,8A min. Remarks: 1000 s: (3.0) Sliding sleeve pre-travel = 6.5 mm Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 33.0...35.0 1000 s: (32.0...36.0) CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 300 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1 , I = 2.5 A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note ramarks

: MB 3,0 W31 : 16.10.91 Test sheet Edition : 03.07.89 Replaces Test oil : ISO-4113

Combination no. : 0 400 076 966

Injection pump

Pump designation : PES6M55C32ORS174 : 0 410 056 988 EP type number

Governor

Governor design. : RSF315/2300M60-27

: 0 420 021 134 Governer no.

Customer-spec. information : DB-PKW Customer

: OM603-Abal. MJ90/ADA Engine

1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 290.0
Rack travel in mm : 6.6...6.8
Del.quantity cm3/: 0.5...0.6
100 s: (0.5...0.9)
Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 2.50 cm3 Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9,1...9,5 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm

Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

G09

cm3 : 2.50Speed rpm : 290 Rack travel in mm : 6.7 Spread 1000 s: (3.00) Testing: STARTING FUEL DELIVERY Speed rpm : 220 Minimum rack trave: 7.00 : 290 rpm Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.50 Speed rpm : 570...670 rpm Rack travel in mm : 20.10...0.00 : 1000 Speed rpm Maximum rack trave: 1.50 HIGH IDLE SET IDLE AUXILIARY SPRING rpm : 360 1st version Speed Rack travel in mm : 5,2...5,4 : (5,1...5,5) Aneroid pressure h: 1100 rpm : 2500 Rack travel in mm : 9.10...9.50 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm: 1000
Rack travel in m: 12.40...12.50
2nd speed rpm: 1800
Rack travel in m: 11.80...12.00
3rd speed rpm: 2200 cm3 : 2.50 Spread 1000 s: (3.00) LOW ID'LE Speed rpm : 290
Rack travel in mm : 6.60...6.80
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) Rack travel in m: 11.50...11.70 Ameroid/Altitude Compensator Test cm3 : 1.00 Spread 1000 s: (1.50) 1st version SETTING/TESTING ELECTRONIC IDLE Setting REGULATION (ELR) : 1000 Speed **Lbw** hPa : 950 Pressure : 0.00...0.20 Rack travel mm Control lever at idle stop rpm : 315 Speed Measurement Rack travel in mm : (12,8...14,2) 1/min: 1000 Speed Del.quantity cm3/: -1000 s: (28,0...36,0) 1st pressure hPa : 900 : 1,8 Rack travel in m: 0.50...0.70 Current A 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 Control lever at full-load stop : 2950 Speed rpm Rack travel in mm: 0.0...1.0 FUEL DELIVERY CHARACTERISTICS Current short-duration A: 3.0 Starting test 1st version Speed rpm : 100 Del.quantity cm3/:-Aneroid pressure h: 1100 rpm : 1800 Del.quantity cm3/: 34.5...36.0 1,8A 1000 s: 52.0 min. 1000 s: (33.5...37.0) cm3 : 2.50Remarks: Spread 1000 s: (3.0) Aneroid pressure h: 1100 Sliding sleeve pre-travel = 6.5 mm Speed rpm : 2200 Del.quantity cm3/ : 33.0...35.0 CHECKING THE IDLE-SPEED AUXILIARY 1000 s: (32.0...36.0) SPRING CUTOFF -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

Note remarks

: MB 3,0 W35 : 14.10.91 Test sheet Edition : 14.11.89 Replaces : ISO-4113 Test oil

: 0 400 076 968 Combination no.

Injection pump

Pump designation : PES6M55C32ORS178 : 0 410 056 986 EP type number

Governor

Governor design. : RSF315/2125M64-13 : 0 420 021 128 Governer no.

Customer-spec. information

Customer : MB-PKW

: 0M603A D35 USA Engine

: 100.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C .: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm.

: (1.65...1.85)

Rack travel in : 20.00...22.00 : 1-5-3-6-2-4 Firing order

per values \_\_\_

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 5.8...5.9

100 s: (5.7...6.0)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.02nd speed Rack travel in mm: 6.1...6.4

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.95)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

Del.quantity

: 58.0...59.0 1000 : (57.0...60.0) cm3 : 2.50

Spread

: (3.00) 1000

RATED SPEED

1st version Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7.4 rpm : 2300 Speed

4th rack travel in: 2700

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER POSITION

: 1000 Speed mqn Rack travel in mm: 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

G12

Speed rpm : 290 + Rack travel in mm : 6.2 + Testing: Speed rpm : 200 + Testing: Test	Speed rpm: 1000 Del.quantity cm3/: 38.039.0 1000 s: (37.040.0) Spread cm3: 2.50 1000 s: (3.00)
Minimum rack trave: 7.00  Speed rpm : 290  Rack travel in mm : 6.106.40  Speed rpm : 1000  Maximum rack trave: 2.00	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4.04.5 : (3,94.6)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00 HIGH IDLE
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 14.2014.30  2nd speed rpm : 1600  Rack travel in m: 13.1013.30  3rd speed rpm : 2000  Rack travel in m: 11.8012.00	1st version Aneroid pressure h: 1850 Speed rpm : 2300 Rack travel in mm : 7.007.40 Del.quantity cm3/ : 22.026.0 1000 s: (21.027.0) Spread cm3 : 2.50 1000 s: (3.00)
Aneroid/Altitude Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.400.80	Speed rpm : 290 Rack travel in mm : 6.106.40 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Table 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.503.70 2nd pressure hPa : 750 Rack travel in m: 5.005.40  FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.213.6) Del.quantity cm3/: - 1000 s: (42.050.0) Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 54.556.0 1000 s: (53.557.0) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 2000 Del.quantity cm3/: 49.051.0 1000 s: (48.052.0) Spread cm3 : 2.50 1000 s: (3.00)	Control lever at full-load stop Speed rpm : 100 Rack travel in mm : 0.01.0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A Remarks:
Aneroid pressure h: 1050	CHECKING THE IDLE-SPEED AUXILIARY

SPRING CUTOFF
-Control-lever position 44,5° max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

## Note remarks

Test sheet : MB 3,0 W23 16.10.91 Edition : 17.02.89 Replaces : ISO-4113 Test oil

: 0 400 076 971 Combination no.

Injection pump

Pump designation : PES6M55C32DRS171 EP type number : 0 410 056 989

Governor

Governor design. : RSF315/2300M60-8 : 0 420 021 114 Governer no.

Customer-spec. information Customer : MB-PKW

: OM603-ECE / ADA Engine

: 80.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-Firing order

Phasing : 0-60-120-180-240-300

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9) Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1100

Anerota 5.32.0 Del.quantity : 31.0...32.0 1000 : (30.0...33.0) Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER POSITION

: 1000 Speed rpm Rack travel in mm : 1,2...1,3

LOW IDLE 1 Control lever

position degrees: 12...16

Setting point w/out bumper spring

cm3 : 2.50Spread Speed rpm : 290 1000 s: (3.00) Rack travel in mm: 6.7 Testing: STARTING FUEL DELIVERY Speed rpm : 220 Minimum rack trave: 8.50 rpm : 290 Speed Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00 Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00 : 600...700 rom : 1000 Speed rom Maximum rack trave: 1.30 HIGH IDLE SET IDLE AUXILIARY SPRING SET IDLE AUXILIANT 5,71...5 Speed rpm : 360 Rack travel in mm : 5,0...5,2 : (4,9...5,3) 1st version Aneroid pressure h: 1100 rpm : 2500 Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.00...12.10 cm3 : 2.50 1000 s: (3.00) Spread 2nd speed rpm : 1400 LOW IDLE Rack travel in m: 11.80...12.00 3rd speed rpm : 2200 Rack travel in m: 11.50...11.70 Speed rpm: 290
Rack travel in mm: 6.60...6.80
Del.quantity cm3/: 5.5...6.5 Aneroid/Altitude 1000 s: (5.0...9.5) Compensator Test cm3 : 1.00Spread 1000 s: (1.50) 1st version SETTING/TESTING ELECTRONIC IDLE Setting REGULATION (ELR) : 1000 Speed **LOW** hPa : 950 Pressure Rack travel mm : 0.00...0.20 Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12,3...13,7) Measurement 1/min: 1000 Speed Del.quantity cm3/: -1000 s: (28,0...36,0) 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Current A 2nd pressure hPa : 750 Control lever at full-load stop Rack travel in m: 1.80...2.20 rpm : 2950 Rack travel in mm: 0.0...1.0 FUEL DELIVERY CHARACTERISTICS Current short-duration A: 3,0 Starting test 1st version Speed rpm: 100 Del.quantity cm3/: -min. 1000 s: 52.0 Aneroid pressure h: 1100 Speed rpm : 1400 Del.quantity cm3/: 31.0...32.5 1,8A 1000 s: (30.0...33.5) cm3 : 2.50 1000 s: (3.0) Remarks: Spread Sliding sleeve pre-travel = 6.5 mm Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 34.0...36.0 1000 s: (33.0...37.0) CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

: 1-5-3-6-2-4 Firing order BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : 0-60-120-180-240-300 : VOL 7,1 b : 20.09.91 Phasing Test sheet Edition : 0.50 (0.75) Tolerance + - ° : 12.9.86 Replaces : ISO-4113 Test oil Time to cyl. no. : 1 : 0 401 846 517 Combination no. BASIC SETTING Injection pump Pump designation : PE6P110A320RS494 1st speed rpm: 700 : 0 411 816 162 EP type number Rack travel in mm : 11.10...11.20 Governor Governor design. : RQV300...1200PA435-3 Governer no. : 0 421 813 498 Del.quantity cm3/: 11.0...11.2 100 s: (10.7...11.5) Customer-spec. information : VOLVO Customer cm3 : 0.4Spread : TD 71GA Engine 100 s: (0.8) 1st version kW : 157.0 rpm : 300.0 : 2400 2nd speed Rated speed Rack travel in mm: 4.6...4.8 Del.quantity cm3/: 1.2...1.6 Spread cm3: 0.3 TEST BENCH REQUIREMENTS 100 s: (0.6) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 417 413 025 GUIDE SLEEVE TRAVEL rpm : 300 1st speed Inlet press., bar: 1.50 : 1.60...1.60 travel mm : 400 2nd speed Test nozzle holder rpm : 0 681 343 009 travel mm : 2.40...2.70 assembly : 800 3rd speed **LDW** : 4.50...4.70 travel mm Openina : 1240 4th speed : 172...175 pressure, bar rpm : 8.20...8.40 travel mm : 1330 5th speed rpm : 9.20...9.40 : 1 680 750 015 travel mm Test Lines GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness : 6.00x1.50x600 Degree: -1 x Length mm rpm : 1150 Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values \_\_\_\_ 1st version rpm : 700 BEGINNING OF DELIVERY Speed Aneroid pressure h: 1000 Test pressure, bar: 25...27 Del.quantity : 170.0...115.0)

: 4.00

1000 : (8.00)

cm3

Spread

: 3.00...3.10

Rack travel in mm : 9.00...12.00

: (2.95...3.15)

Prestroke mm

RATED SPEED

1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 10.10

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

Speed rpm: 1310...1340 4th rack travel in: 1450

rom : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

: 100 Speed man Minimum rack trave: 6.10

Speed rpm: 300

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 300...480 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1000 Pressure

: 11.10...11.20 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.10

2nd pressure hPa : 420

Rack travel in m: 10.90...11.00

3rd pressure hPa : 290

Rack travel in m: 10.20...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1000 Del.quantity cm3/: 112.5...115.5 1000 s: (109.0...119.0)

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 89.0...91.0 1000 s: (86.0...94.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...190.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.30...4.50

Del.quantity cm3/: 12.0...16.0

1000 s: (-)

cm3 : 3.00Spread

1000 s: (6.00)

Remarks:

Note remarks

: VOL 7,1 b 3 Test sheet Edition : 20.09.91 Replaces : 12.9.86

: ISO-4113 Test oil

Combination no. : 0 401 846 524

Injection pump

Pump designation : PE6P110A320RS494-1

EP type number : 0 411 816 168

Governor

Governor design. : RQV300...1200PA435-4

: 0 421 813 527 Governer no.

Customer-spec. information : VOLVO Customer

: TD 71K Engine

: 177.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Phasing

Firing order

: 0-60-120-180-240-300

: 1-5-3-6-2-4

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm : 700

Rack travel in mm : 11.90...12.20

Del.guantity cm3/: 12.2...12.4

100 s: (11.9...12.7)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm: 4.8...5.0 Del.quantity cm3/: 1.7...2.1

100 s: (-)

cm3 : 0.3

Spread 100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

1.40...1.60 travel mm

rom : 400 2nd speed

2.30...2.60 travel mm

rpm : 800 3rd speed

: 4.40...4.60 travel mm

: 1240 4th speed rpm : 7.80...8.00 travel mm

5th speed : 1340 rom

: 8.90...9.10 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1300

Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 1000

Del.quantity : 122.0...127.0)

**G20** 

cm3cm3 : 4.00 1000 : (7.50) Spread RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 10.90 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 rpm : 1330...1360 Speed 4th rack travel in: 1450 rom : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 63...71 Testina: rpm : 100 Speed Minimum rack trave: 6.30 rpm : 300 Speed Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 300...510 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1000 Pressure Rack travel mm : 11.90...12.00 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.60...9.70 2nd pressure hPa : 510 Rack travel in m: 11.70...11.80 3rd pressure hPa : 220 Rack travel in m: 9.80...10.00 FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 79.0...81.0 1000 s: (76.0...84.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.90

rpm : 1240...1250

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 165.0...185.0 1000 s: (-) Rack travel in mm : 20.00...21.00

LOW IDLE

Speed

Speed rpm : 300 Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 12.0...16.0 1000 s: (-) Spread cm3 : 3.00 1000 s: (6.00)

Remarks:

G21

Speed

Speed

1st version

Aneroid pressure h: 1000

Aneroid presture h: -

rpm : 1000 Del.quantity cm3/: 121.5...124.5 1000 s: (118.0...128.0)

rpm : 700

Note remarks

: MAN 11,9 u1 Test sheet : 18.09.91 : 26.2.91 Edition Replaces : ISO-4113 Test oil

: 0 402 036 740 Combination no.

Injection pump

Pump designation : PES6P120A720/3LS3255

: 0 412 026 739 EP type number

Governor

Governor design. : RQ300/1000PA813-13

Governer no. : 0 421 801 529

Customer-spec. information : MAN Customer

: D2866LF03 Engine

1st version kW : 273.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 : (3.65...3.85) Prestroke mm

Rack travel in mm : 14.50...15.50 : 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 15.0...16.0 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 15.00...15.10

Dei.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 4.9...5.3 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

8.0 : Emp Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 550 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1200

: 242.0...244.3 Del.quantity

1000 : (239.0...247.0) cm3 : 5.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point: Speed Rack travel in mm: 20.0

: 550 rpm

Testing:

1st rack travel in: 13.80

Speed rpm : 1045...1060

2nd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Speed Rack travel in mm: 5.0

Testing:

: 200 Speed rpm Minimum rack trave: 6.50 : 300 rom

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 360...400 Speed mom

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1000 Rack travel in m: 14.80...14.90

rpm : 700 2nd speed

Rack travel in m: 15.30...15.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 **beed** rpm Pressure hPa : 1200

: 15.00...15.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90
2nd pressure hPa : 110
Rack travel in m: 12.00...12.10
3rd pressure hPa : 470
Rack travel in m: 13.70...14.10

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 1000 Speed CDIII

Del.quantity cm3/: 236.0...242.0 1000 s: (233.0...245.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

## **BREAKAWAY**

1st version

1mm rack travel less than

full load rack tr: 13.80

rpm : 1045...1060 Speed

INTERMEDIATE RATED SPEED

Rack travel in mm: 4.00

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 220.0...240.0 1000 s: (216.0...244.0)

LOW IDLE

Speed rpm

Rack travel in mm : 4.90...5.30

Del.quantity cm3/: 17.0...23.0

1000 s: (14.0...26.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 0-7050

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

Note remarks

: RVI 12,0 L Test sheet : 02.08.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 046 828 Combination no.

Injection pump

Pump designation : PES6P120A320RS3288

: 0 412 026 750 EP type number

Governor

Governor design. : RQV275...1000PA995-2

: 0 421 813 940 Governer no.

Customer-spec. information : RVI Customer

: MIDR 063540 M/3 Engine

: 236.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test Lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.35...3.45 : (3.30...3.50) Prestroke mm

Rack travel in mm : 18.00...21.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 22.4...22.6

100 s: (22.1...22.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm : 4.6...5.0

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1070 1st speed

: 8.30...8.50 travel mm

rpm : 275 2nd speed

: 1.20...1.40 travel mm

rpm : 500 3rd speed

: 3.60...4.20 travel mm

: 750 4th speed rpm

travel mm : 5.70...6.10

: 1450 5th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1180

Speed

Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

Aneroid pressure h: 1000

Del.quantity : 224.0...229.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 296...304

Testing:

1st rack travel in: 10.70 Speed rom: 1065...1075 2nd rack travel in: 4.00

Speed rpm : 1165...1195 4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 244...252

Testing:

: 200 Speed rpm Minimum rack trave: 6.80 Speed : 300 COM

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 310...420 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed

: 500 rom hPa : 1000 Pressure

: 11.70...11.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.20...9.60

2nd pressure hPa : 280
Rack travel in m: 11.00...11.10

3rd pressure hPa : 160
Rack travel in m: 10.00...10.20

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 : 1000 Speed **LDW** 

G25

Del.quantity cm3/: 210.0...216.0 1000 s: (207.0...219.0)

: 600 Speed וחכרו Aneroid pressure h: -: 500

Speed rpm Del.quantity cm3/: 150.0...152.0 1000 s: (147.0...155.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...200.0 1000 s: (166.0...204.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.60...5.00 Del.quantity cm3/: 16.0...22.0

1000 s: (13.0...25.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: RVI 9,8 r Test sheet : 21.08.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 046 829

Injection pump

Pump designation : PES6P120A320RS3284

: 0 412 026 749 EP type number

Governor

Governor design. : RQV275...1050PA995-1

: 0 421 813 941 Governer no.

Customer-spec. information Customer

: MIDR 062045 B/3 Engine

: 186.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke min : (3.45...3.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 14.8...15.0

100 s: (14.5...15.3)

cm3 : 0.5 Spread

100 s: (0.9)

rpm : 275.0 2nd speed Rack travel in mm: 5.2...5.6 Del.quantity cm3/: 2.0...2.6 100 s: (1.7...2.9)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1130 1st speed

8.10...8.30 travel mm

: 275 2nd speed rpm

: 0.70...0.90 travel mm

rpm : 450 3rd speed

: 2.80...3.40 : 750 travel mm

4th speed rom

: 5.50...5.90 travel mm

5th speed : 1450 rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1270 Speed

Rack travel in mm : 9.20...11.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1000

Del.quantity : 140.0...153.0)

cm3: 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 296...304

Testing:

1st rack travel in: 9.50

rpm : 1125...1135 Speed

2nd rack travel in: 4.00 Speed rpm : 1210...1240

4th rack travel in: 1450

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control Lever position degrees: 243...251

Testina:

rpm : 200 Speed Minimum rack trave: 6.90

: 275 Speed rom

Rack travel in mm : 5.40...5.50

CONSTANT REGULATION

rpm : 340...440 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed **PDIT** hPa : 1000 Pressure

: 10.50...10.60 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 200
Rack travel in m: 9.90...10.00
3rd pressure hPa : 140

Rack travel in m: 9.50...9.70

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 1050 Speed

Del.quantity cm3/: 144.0...150.0 1000 s: (141.0...153.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 105.0...107.0 1000 s: (102.0...110.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50

rpm : 1125...1135 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 125.0...155.0 1000 s: (121.0...159.0)

LOW IDLE

rpm : 275 Speed

Rack travel in mm : 5.20...5.60

Del.quantity cm3/: 20.0...26.0 1000 s: (17.0...29.0)

Spread

cm3 : 8.00 1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

: 4.40...4.50 Prestroke mm BOSCH INJ. PUMP TEST SPECIFICATIONS : (4.35...4.55) Rack travel in mm : 19.00...21.00 Note remarks : 6-2-4-1-5-3 Firing order : MB 11,7 j 4 Test sheet : 30.08.91 Edition : 2.8.91 Replaces : 0-60-120-180-240-300 Phasina : ISO-4113 Test oil Tolerance + - \* : 0.50 (0.75) : 0 402 046 831 Combination no. Time to cyl. no. : 6 Injection pump Pump designation : PES6P110A720LS3282 : 0 412 016 736 EP type number BASIC SETTING Governor rpm: 1100 Governor design. : R0300/1100PA1015 1st speed Governer no. : 0 421 801 .613 Rack travel in mm: 13.00...13.10 Customer-spec. information Del.quantity cm3/: 13.6...13.8 Customer : MERCEDES-BENZ 100 s: (13.3...14.0) : 0M447 h Engine cm3 : 0.4: 157.0 Spread 1st version kW : 2200 Rated speed 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Rack travel in mm : 8.7...9.1 Test oil Del.quantity cm3/: 1.4...2.0 inlet temp. °C : 38...42 100 s: (1.1...2.3) cm3 : 0.4 Spread Overflow valve 100 s: (0.8) : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -1 Overflow Speed rpm : 600 Rack travel in mm : 13.50...14.50 quantity min. 1/h: 100...120 Test nozzle holder FULL LOAD DELIV. AT FULL LOAD STOP : 0 681 343 009 assembly 1st version Opening rpm : 1100 Speed pressure, bar : 172...175 : 136.0...138.0 Del.quantity 1000 : (133.5...140.5) : 4.00 : 1 680 750 015 cm3 Test Lines Spread 1000 : (8.00) Outside diameter RATED SPEED x Wall thickness : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Speed Set equal delivery quant. rom Rack travel in mm: 14.0 per values Testing: BEGINNING OF DELIVERY 1st rack travel in: 12.00

rpm : 1140...1150

Speed

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1250

rpm : 0.00...2.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.3

Testing:

Speed rpm : 200 Minimum rack trave: 8.80 : 300 Speed rpm

Rack travel in mm : 7.20...7.40

Rack travel in mm: 2.00

rpm : 370...410 Speed

FUEL DELIVERY CHARACTERISTICS

1st version

: 600 Speed rom

Del.quantity cm3/: 113.0...116.0 1000 s: (110.0...119.0)

cm3 : 5.00 1000 s: (9.00) Spread

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.00

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Remarks:

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

## BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : 0-60-120-180-240-300 Phasing : KHD 9,6 y 1 Test sheet Tolerance + - ° : 0.50 (0.75) : 27.09.91 Edition Replaces Time to cyl. no. : 1 : ISO-4113 Test oil BASIC SETTING Combination no. : 0 402 046 832 rpm: 1100 1st speed Injection pump Pump designation : PES6P110A720RS3104 Rack travel in mm : 13.90...14.00 : 0 412 016 712 EP type number Governor Del.quantity cm3/: 16.3...16.5 Governor design. : RQV350...1100PA850-6 : 0 421 813 975 Governer no. 100 s: (16.0...16.8) Customer-spec. information cm3 : 0.4Spread Customer : KHD 100 s: (0.7) : BF6L513RC Engine 2nd speed rpm : 350.0 Rack travel in mm : 7.9...8.1 : 200.0 1st version kW : 2200 Rated speed Del.quantity cm3/: 1.6...2.1 100 s: (1.4...2.4) TEST BENCH REQUIREMENTS cm3 : 0.4Spread 100 s: (0.7) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 417 413 025 GUIDE SLEEVE TRAVEL rpm : 350 Inlet press., bar: 1.50 1st speed : 1.10...1.30 travel mm rpm : 410 2nd speed Test nozzle holder : 2.60...3.20 : 0 681 343 009 travel mm assembly : 590 3rd speed rpm : 3.90...4.50 travel mm Opening : 1160 : 172...175 4th speed pressure, bar rpm : 8.60...8.80 travel mm : 1215 5th speed rpm : 1 680 750 015 travel mm : 9.80...10.20 Test Lines GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 rpm : 1190 : 6.00X1.50X600 x Length mm Speed Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values \_\_\_\_ 1st version rpm : 1100 Speed BEGINNING OF DELIVERY Aneroid pressure h: 550 Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

: 4.00

1000 : (7.50)

cm3

Spread

Prestroke mm

Firing order

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

: 1-5-3-6-

RATED SPEED

1st version Control Lever

position degrees: 118...126

Testina:

1st rack travel in: 12.90

Speed rpm : 1130...1140

2nd rack travel in: 4.00

Speed rpm : 1190...1220 4th rack travel in: 1310

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 86...94

Testina:

: 100 Speed rom

Minimum rack trave: 9.50

Speed rpm : 350 Rack travel in mm : 7.90...8.10

CONSTANT REGULATION

rpm : 400...470 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

pm : 500 hPa : 550 Speed mar Pressure

: 13.90...14.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 12.30...12.50

2nd pressure hPa : 450

Rack travel in m: 13.40...13.50

3rd pressure hPa : 370

Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 450 Speed

Del.quantity cm3/: 123.0...125.0

1000 s: (120.0...128.0)

cm3 : 4.00Spread

1000 s: (7.50)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1130...1140

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 170.0...200.0 1000 s: (166.0...204.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: DEE 7,6 y 2 : 21.08.91 : 19.3.91 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 076 742

Injection pump

Pump designation : PES6P120A720RS3203 : 0 412 026 728

EP type number

Governor

Governor design. : RSV400...1050P2A534-

: 0 421 833 356 Governer no.

Customer-spec. information : JOHN DEERE Customer

: 6076 HZ030 Engine

: 193.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x3.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY Test pressure, bar: 27...29 Phasina

: 0-60-120-180-240-300

: 3.55...3.65

: (3.50...3.70)

: 1-5-3-6-2-4

Tolerance + - ° : 0.50 (0.75)

Rack travel in mm: 10.50

Time to cyl. no. : 1

BASIC SETTING

Prestroke mm

Firing order

rpm: 1050 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 15.4...15.6

100 s: (15.2...15.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 400.0 2nd speed Rack travel in mm: 6.2...6.4 Del.quantity cm3/: 3.0...3.6 100 s: (2.8...3.8)

cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900

154.5...156.5 1000 : (152.5...158.5) cm3 : 5.00 Del.quantity

Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 41...49

H04

Testing: 1st rack travel in: 11.10 rpm : 1095...1105 Speed 2nd rack travel in: 4.00 Speed rpm : 1155...1165 3rd rack travel in: 4.00 rpm : 1155...1185 4th rack travel in: 1300 : 0.30...1.40 Speed COM LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.8 Testing: : 100 Speed rpm Minimum rack trave: 19.00 rpm : 400 Speed Rack travel in mm : 6.20...6.40 TORQUE CONTROL Torque control curve - 1st version 1st speed 🕬 : 1050 Rack travel in m: 12.10...12.20 2nd speed rpm : 700 Rack travel in m: 13.60...13.80 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : 900 Pressure : 13.60...13.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : Rack travel in m: 10.70...10.90
2nd pressure hPa : 375
Rack travel in m: 11.20...11.60 3rd pressure hPa : 590 Rack travel in m: 12.70...12.90 FUEL DELIVERY CHARACTERISTICS 1st version

Del.quantity cm3/: 116.5...120.5 1000 s: (114.5...122.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.10 rpm : 1095...1105 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0) Rack travel in mm: 20.00...21.00 LOW IDLE rpm : 400 Speed Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 30.0...36.0 1000 s: (28.0...38.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks:

: JOHN DEERE # RE47549

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

H05

Speed

Speed

Aneroid pressure h: 900

Aneroid pressure h: -

LOUI

: 700

Del.quantity cm3/: 188.5...194.5 1000 s: (185.5...197.5)

rpm : 800

Note remarks

: PER 16,3 d2 Test sheet : 18.09.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 638 805 Combination no.

Injection pump

Pump designation : PE8P12OA12ORS7199

: 0 412 628 843 EP type number

Governor

Governor design. : RQ750PA871-2 : 0 421 801 627 Governer no.

Customer-spec. information

: PERKINS (RR) Customer

: CV8-360 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

10

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.00...4.10 : (3.95...4.15)

Rack travel in mm : 9.00...12.00

H06

: 1- 3- 6- 5- 4- 8-7- 2 Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.00...13.10

bel.quantity cm3/: 36.2...36.4

100 s: (35.9...36.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 4.9...5.1 Del.quantity cm3/ : 3.6...4.2

100 s: (3.3...4.5)

8.0 : Emp Spread

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Del.quantity

: 362.0...364.0 1000 : (359.0...367.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 87...95

Testing:

1st rack travel in: 12.00 Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm: 773...788
4th rack travel in: 900

: 0.00...1.00 rom: Speed

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00 Speed rpm : 750...755

Remarks: :
APPLICATION

Generator

Note remarks

: MB 22,0 a 1 : 20.09.91 Test sheet Edition Replaces : 17.10.90 Test oil : ISO-4113

Combination no. : 0 402 640 821

Injection pump

Pump designation : PE12P120A520LS7814 : 0 412 620 813

EP type number

Governor

Governor design. : RQV350...1050PA870-9

: 0 421 813 873 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: OM 444 LA Engine

: 588.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 : (4.75...4.95) Prestroke mm

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-

4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 650 1st speed

Rack travel in mm : 13.50...13.70

Del.guantity cm3/: 26.3...26.5

100 s: (26.0...26.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed : 1.30...1.80 travel mm

: 600 2nd speed rpm

: 3.30...3.80 travel mm

900 3rd speed rpm

: 5.40...5.90 travel mm

: 1100 4th speed rpm

travel mm

: 7.60...8.10 : 1200 5th speed rpm

: 9.60...10.10 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

2nd pressure hPa : 700 FULL LOAD DELIV. AT FULL LOAD STOP Rack travel in m: 11.60...11.80 3rd pressure hPa : 1400 Rack travel in m: 13.70...13.80 1st version rpm : 650 Speed 4th pressure hPa : Aneroid pressure h: 1100 Del.quantity : 203.0...268.0) Rack travel in m: 7.90...8.20 : 5.00 START CUT-OUT cm3 Spread 1000 : (9.00) 1/min: 310 (330) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever 1st version position degrees: 117...125 Aneroid pressure h: 1850 Speed rpm : 1050 Del.quantity cm3/ : 261.0...264.0 Testing: 1st rack travel in: 12.40 1000 s: (258.0...267.0) rpm : 1090...1100 Speed cm3 : 8.002nd rack travel in: 4.00 Spread 1000 s: (12.0) rpm : 1160...1190 Speed Aneroid pressure h: 1850 4th rack travel in: 1250 : 850 rpm : 0.00...1.00Speed rpm Speed Del.quantity cm3/: 278.0...282.0 1000 s: (275.0...285.0) LOW IDLE 1 Control lever Spread cm3 1000 s: (12.0) position degrees: 62...70 Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 130.0...132.0 Testing: Speed **DOM** 1000 s: (127.0...135.0) Minimum rack trave: 6.50 cm3 : 8.00rpm : 350 Spread Speed 1000 s: (12.0) Rack travel in mm : 4.90...5.50 CONSTANT REGULATION rpm : 350...600 **BREAKAWAY** Speed 1st version TORQUE CONTROL 1mm rack travel less than : 0.60 Dimension a mm Torque control curve - 1st version full load rack tr: 12.40 1st speed rpm : 1050 rpm : 1090...1100 Rack travel in m: 13.40...13.60 Speed 2nd speed rpm : 850 Rack travel in m: 14.00...14.20 STARTING FUEL DELIVERY Aneroid/Altitude : 100 Speed rpm Compensator Test Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) 1st version Remarks: Setting : 650 Speed rpm hPa : 1100 Pressure : 13.50...13.70 Rack travel mm Measurement 1/min: 650 Speed 1st pressure hPa : 500 Rack travel in m: 9.60...9.80

Note remarks

: MAN 21,0 f2 Test sheet : 08.10.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 640 824

Injection pump

Pump designation : PE12P12OA52OLS7824-1

: 0 412 620 825 EP type number

Governor

: RQV300...1150PA977K Governor design.

: 0 421 815 265 Governer no.

Customer-spec. information : MAN Customer

: D2842LXF Engine

: 735.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

x Length mm

: 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

: 345 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 30.8...31.0

100 s: (30.5...31.3)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.4 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1195 1st speed

: 10.10...10.30 travel mm

rpm : 300 2nd speed

: 1.00...1.20 travel mm

rpm : 550 3rd speed

: 3.40...4.00 travel mm

rpm : 900 4th speed

: 7.00...7.40 travel mm 5th speed rpm : 1450

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1215

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

nom : 1150 Aneroid pressure h: 1400 : 308.0...310.0 Del.quantity 1000 : (305.0...313.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 295...303 Testing: 1st rack travel in: 12.70 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1300...1330 Speed 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 246...254 Testing: rpm : 100 Speed Minimum rack trave: 6.70 Speed rom Rack travel in mm : 5.10...5.30 CONSTANT REGULATION rpm : 330...450 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version st speed rpm : 1150
Rack travel in m: 13.70...13.80 1st speed 2nd speed rpm : 700 Rack travel in m: 12.10...12.30 3rd speed rpm : 900 Rack travel in m: 13.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting : 1185 Speed rpm hPa : 1400 Pressure : 13.70...13.80 Rack travel mm Measurement 1/min: 1185 Speed 1st pressure hPa : -

Rack travel in m: 8.50...8.70

2nd pressure hPa : 250

Rack travel in m: 8.90...9.00 3rd pressure hPa : 650 Rack travel in m: 10.80...11.10 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 700 Del.quantity cm3/ : 254.0...260.0 1000 s: (251.0...263.0) Aneroid pressure h: 1400 Speed rpm : 900 Del.quantity cm3/ : 285.0...291.0 1000 s: (282.0...294.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 141.0...143.0 1000 s: (138.0...146.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.70 rpm : 1190...1200 Speed STARTING FUEL DELIVERY : 100 Speed rom Del.quantity cm3/: 255.0...275.0 1000 s: (251.0...279.0) LOW IDLE Speed rpm : 300
Rack travel in mm : 5.00...5.40
Del.quantity cm3/ : 17.0...23.0
1000 s: (14.0...26.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : MAN-NR. 3-7024 Setting and blocking of pointer of start-of-delivery sensor on cyl. 12 start of delivery

Set pneumatic shutoff device to

control-rod stop = 0.5...1.5 mm

control-rod travel at 4.5 bar

atmospheric pressure. H12

Note remarks

: MB 21,9 j 3 Test sheet : 18.09.91 Edition : 28.3.91 Replaces : ISO-4113 Test oil

: 0 402 640 826 Combination no.

Injection pump

Pump designation : PE12P12OA32OLS7813-2

: 0 412 620 826 EP type number

Governor

Governor design. : RQ750PA966-3 : 0 421 801 572 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 LA

: 441.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 16.00...16.10

Del.quantity cm3/: 28.0...28.2

100 s: (27.7...28.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 5.6...6.2 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 280.0...282.0 Del.quantity 1000 : (277.0...285.0) cm3 : 5.00 1000 : (9.00)

Spread

RATED SPEED

1st version

Control lever

position degrees: 86...94

Testing:

1st rack travel in: 15.00

rpm : 755...760 Speed 2nd rack travel in: 4.00

Speed rpm : 785...795 4th rack travel in: 1000

Speed rpm : 0.00...1.00

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 15.00 Speed rpm : 755...760 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 270.0...290.0 1000 s: (266.0...294.0)

Remarks:

Observe VDT-I-420/120

APPLICATION

Generator

Note remarks

: MAN 21,0 f3 Test sheet : 03.06.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 640 831

Injection pump

Pump designation : PE12P12OA520LS7824-3

: 0 412 620 829 EP type number

Governor

Governor design. : RQV250...1150PA977K

: 0 421 815 265 Governer no.

Customer-spec. information : MAN Customer

: D2842LXF Engine

: 735.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening 1 4 1

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1,50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

: 345 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 30.8...31.0

100 s: (30.5...31.3)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1195 1st speed

travel mm 10.10...10.30

rpm : 300 2nd speed

travel mm : 1.00...1.20

3rd speed : 550 rpm

: 3.40...4.00 : 900 travel mm 4th speed

rpm : 7.00...7.40

travel mm : 1450 5th speed rom

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1215

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Rack travel in m: 8.90...9.00 rpm : 1150 Speed 3rd pressure hPa : 650 Rack travel in m: 10.80...11.10 Aneroid pressure h: 1300 : 308.0...310.0 Del.quantity 1000 : (305.0...313.0) : 5.00 START CUT-OUT cm3 Spread 1000 : (9.00) 1/min: 240 (260) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 295...303 1st version Aneroid pressure h: 1300 rpm : 700 Speed Testina: Del.quantity cm3/: 256.0...262.0 1000 s: (253.0...265.0) 1st rack travel in: 12.70 rpm : 1190...1200 Speed Aneroid pressure h: 1300 2nd rack travel in: 4.00 Speed rpm : 900 Del.quantity cm3/ : 285.0...291.0 1000 s: (282.0...294.0) rpm : 1300...1330 Speed 4th rack travel in: 1450 rpm : 0.00...1.00Speed Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 141.0...143.0 LOW IDLE 1 Control lever 1000 s: (138.0...146.0) position degrees: 246...254 Testing: rpm : 100 BREAKAWAY Speed Minimum rack trave: 6.70 Speed rpm : 300 Rack travel in mm : 5.10...5.30 1st version 1mm rack travel less than full load rack tr: 12.70 Speed rpm : 1190...1200 CONSTANT REGULATION rpm : 330...450 Speed Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1150 rpm : 100 Speed Del.quantity cm3/: 255.0...275.0 1000 s: (251.0...279.0) Rack travel in m: 13.70...13.80 2nd speed rpm : 700 Rack travel in m: 12.10...12.30 3rd speed rpm : 900 LOW IDLE Rack travel in m: 13.00...13.20 Speed rpm : 300 Rack travel in mm : 5.00...5.40 Aneroid/Altitude Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Compensator Test cm3 : 8.00 1000 s: (12.00) Spread 1st version Setting : 1150 Remarks: Speed rpm : MAN-NR. 3-7024 hPa : 1300 Pressure : 13.70...13.80 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 12 Measurement 1/min: 1150 start of delivery Speed Set pneumatic shutoff device to 1st pressure hPa : control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar Rack travel in m: 8.50...8.70 2nd pressure hPa : 250

H16

atmospheric pressure.

Note remarks

Test sheet Edition : MAN 21,0 f4 : 08.10.91

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 640 831

Injection pump

Pump designation: PE12P12OA52OLS7824-3

: 0 412 620 829 EP type number

Governor

Governor design. : RQV300...1150PA977K

: 0 421 815 265 Governer no.

Customer-spec. information : MAN Customer

: D2842LXF Engine

: 735.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke mm : (4.45...4.65)

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-Firing order 4- 11- 10- 2- 6- 7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

: 345 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 30.8...31.0

100 s: (30.5...31.3)

cm3 : 0.5

Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1195 1st speed

: 10.10...10.30 travel mm

rpm : 300 2nd speed

: 1.00...1.20 travel mm

: 550 3rd speed riom

: 3.40...4.00 travel mm

: 900 4th speed rom

: 7.00...7.40 travel mm

: 1450 5th speed rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1185 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Rack travel in m: 8.90...9.00 3rd pressure hPa : 650 Rack travel in m: 10.80...11.10 Speed rpm : 1150 Aneroid pressure h: 1400 Speed Del.quantity : 308.0...310.0 1000 : (305.0...313.0) cm3 : 5.00 1000 : (9.00) START CUT-OUT Spread 1/min : 240 (260) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever 1st version position degrees: 295...303 Aneroid pressure h: 1400 Speed rpm : 700
Del.quantity cm3/ : 254.0...260.0
1000 s: (251.0...263.0)
Aneroid pressure h: 1400
Speed Testing: 1st rack travel in: 12.70 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 Speed rpm : 900 Del.quantity cm3/ : 285.0...291.0 1000 s: (282.0...294.0) rpm : 1300...1330 Speed 4th rack travel in: 1450 : 0.00...1.00 Speed rom Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 141.0...143.0 LOW IDLE 1 Control lever 1000 s: (138.0...146.0) position degrees: 246...254 Testing: **BREAKAWAY** rpm Speed Minimum rack trave: 6.70 1st version riom. Rack travel in mm : 5.10...5.30 1mm rack travel less than full load rack tr: 12.70 CONSTANT REGULATION rpm : 1190...1200 rpm : 330...450 Speed Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 100 1st speed rpm : 1150 Speed Del.quantity cm3/: 255.0...275.0 1000 s: (251.0...279.0) Rack travel in m: 13.70...13.80 2nd speed rpm : 700 Rack travel in m: 12.10...12.30 3rd speed rpm : 900 LOW IDLE Rack travel in m: 13.00...13.20 rpm : 300 Speed Rack travel in mm : 5.00...5.40 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Aneroid/Altitude Compensator Test Spread cm3 : 8.00 1000 s: (12.00) 1st version Setting : 1150 Remarks: Speed rpm hPa : 1400 : MAN-NR. 3-7024 Pressure : 13.70...13.80 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 12 Measurement start of delivery 1/min: 1150 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.70 2nd pressure hPa : 250 Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar

H19

atmospheric pressure.

Note remarks

: MB 21.9 x 3 : 27.09.91 Test sheet Edition : 28.6.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 640 835

Injection pump

Pump designation : PE12P12OA320LS7807-4

: 0 412 620 830 EP type number

Governor

Governor design. : RQV350...900PA870-15

: 0 421 813 944 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 A Engine

: 375.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm: 9.00...12.00 Firing order: 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-180-225-240-285-300-Phasing

345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 17.9...18.1

100 s: (17.6...18.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.2...5.8 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.30...1.80 travel mm

rpm : 655 2nd speed

: 4.80...5.30 travel mm

rpm : 960 3rd speed

: 8.70...9.20 travel mm

rpm : 1120 4th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 950 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 900 Speed Aneroid pressure h: 1100 Del.quantity : 1/9.0...184.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 11.30 rpm : 940...950 Speed 2nd rack travel in: 4.00 rpm : 1010...1040 Speed 4th rack travel in: 1250 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 62...70 Testing: Speed rpm Minimum rack trave: 6.80 Speed rpm : 350 Rack travel in mm : 5.20...5.80 CONSTANT REGULATION rpm : 400...600 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : Pressure : 10.30...10.60 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 10.70...10.90 2nd pressure hPa : 400 Rack travel in m: 11.70...11.90 START CUT-OUT 1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1100 Speed rpm : 600 Del.quantity cm3/ : 172.0...177.0 1000 s: (169.0...180.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than

full load rack tr: 11.30 Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

Remarks:

H22

## Note remarks

: MB 11,0 t13 Test sheet : 27.09.91 Edition : 21.6.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 838

Injection pump

Pump designation : PE6P120A320LS7808 EP type number : 0 412 626 816

Governor

Governor design. : RQ300/1050PA762-4 : 0 421 801 390

Governer no.

Cust. part no. : T3

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M441 LA Engine

: 240.0 1st version kW : 2100 Rated speed

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test Lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.5 Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.6...6.2

Del.quantity cm3/: 1.3...1.9 100 s: (1.0...2.2)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 900

Anerota Del.quantity 1000 : 214.0...216.0 : (211.0...219.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm Rack travel in mm: 20.0

Testina:

1st rack travel in: 13.80

rpm : 1095...1110 Speed

2nd rack travel in: 4.00

Speed rpm : 1155...1185

4th rack travel in: 1300

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm Rack travel in mm: 5.9

Testing:

Speed rpm : 200 Minimum rack trave: 7.90

Speed rpm : 300 Rack travel in mm : 5.60...6.20

Rack travel in mm : 2.00

: 380...420 Speed rpm

TORQUE CONTROL

Dimension a mm : 0.30 : 1050 2nd speed rpm

Rack travel in m: 14.80...15.00

3rd speed rpm : 800

Rack travel in m: 15.00...15.20

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 900 Pressure

: 13.90...14.10 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : 300 Rack travel in m: 10.70...10.90 2nd pressure hPa : 550 Rack travel in m: 12.90...13.10 3rd pressure hPa : 1050 Rack travel in m: 14.00...14.10 \*

4th pressure hPa : 1150

Rack travel in m: 14.40...14.70

5th pressure hPa : -

Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1450

: 1050 Speed rpm

Del.quantity cm3/: 236.0...239.0 1000 s: (233.0...242.0)

cm3 : 8.00Spread

1000 s: (12.0) Aneroid pressure h: 1450

: 800 Speed rpm

Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.80

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0

1000 s: (196.0...224.0)

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: DAF 11,7 k6 : 27.09.91 Test sheet Edition : 22.3.91 Replaces : ISO-4113 Test oil

: 0 402 646 894 Combination no.

Injection pump

Pump designation : PE6P120A320RS7194 : 0 412 626 834 EP type number

Governor

Governor design. : RQ250/1000PA936 : 0 421 801 507 Governer no.

Customer-spec. information : DAF Customer

Engine : WS 295

1st version kW : 295.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm : (5.15...5.35)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance - - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 23.9...24.1

100 s: (23.6...24.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 7.6...8.0 Del.quantity cm3/ : 2.2...2.8 100 s: (1.9...3.1)

cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

Aneroid pressure h: 1000

Del.quantity : 237.0...244.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 550 rpm Rack travel in mm: 15.8

Testing:

1st rack travel in: 12.70

rpm : 1035...1050 Speed 2nd rack travel in: 4.00 Speed rpm: 1130...1160 4th rack travel in: 1250 rpm : 0.00...1.40 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 250 Speed Rack trayel in mm: 7.0 Testina: rpm : 100 Speed Minimum rack trave: 8.50
Speed rpm: 250
Rack travel in mm: 6.90...7.10
Rack travel in mm: 2.00
Speed rpm: 345...385 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 14.70...14.80 2nd speed rpm : 1000 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure Rack travel mm : 13.70...13.80 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.20 2nd pressure hPa : 460 Rack travel in m: 13.00...13.10 3rd pressure hPa : 310 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 165.0...167.0 1000 s: (162.0...170.0) BREAKAWAY

1st version

**H26** 

1mm rack travel less than

full load rack tr: 12.70 rpm : 1035...1050 Speed

LOW IDLE

Speed rpm : 250 Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: DAF 11,7 j2 : 27.09.91 Test sheet Edition : 6.7.90 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 895

Injection pump

Pump designation : PE6P120A320RS7202 : 0 412 626 835 EP type number

Governor

Governor design. : RQV250...1000PA939

: 0 421 813 829 Governer no.

Customer-spec. information : DAF Customer

Engine : WS 268

: 268.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 089 Test lines

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

rom: 850 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 20.8...21.0

100 s: (20.5...21.3)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 4.9...5.3 Del.quantity cm3/: 2.1...2.7

100 s: (1.8...3.0)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 0.70...1.10 travel mm

rpm : 400 2nd speed

2.50...3.10 travel mm

: 700 3rd speed rpm : 4.50...4.90 travel mm

: 1045 4th speed rpm

: 7.80...8.00 travel mm

: 1350 5th speed man

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1125 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 1000

: 208.5...210.5 1000 : (205.5...213.5) Del.quantity

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 113...121

Testina:

1st rack travel in: 10.90 Speed rpm : 1030...1040

2nd rack travel in: 4.00

rpm : 1120...1150 Speed

4th rack travel in: 1300

rom : 0.00...1.40Speed

LOW IDLE 1 Control Lever

position degrees: 74...82

Testing:

Speed rpm : 100 Minimum rack trave: 6.60 : 250 COM

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 270...380 Speed

Aneroid/Altitude Compensator Test

1st version Settina

: 600 Speed COM hPa : 1000 Pressure

: 11.90...12.00 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 320

Rack travel in m: 11.10...11.20

3rd pressure hPa : 190

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 145.5...147.5

1000 s: (142.5...150.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.90

rpm : 1030...1040 Speed

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 21.0...27.0 1000 s: (18.0...30.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of painter of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: DAF 11,7 k4 : 27.09.91 : 22.3.91 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 896

Injection pump

Pump designation : PE6P120A320RS7194 EP type number : 0 412 626 834

Governor

Governor design. : RQV250...1000PA939

Governer no. : 0 421 813 829

Customer-spec. information : DAF Customer

: WS 295 Engine

: 295.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 089 Test lines

Outside diameter x Wall thickness

: 8.00X2.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.25) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 13.70...13.80

Del.guantity cm3/: 23.9...24.1

100 s: (23.6...24.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 7.6...8.0

Del.quantity cm3/: 2.2...2.8 100 s: (1.9...3.1)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 0.70...1.10 travel mm

rpm : 400 2nd speed

: 2.50...3.10 travel mm

rpm : 700 3rd speed

: 4.50...4.90 travel mm

rpm : 1045 4th speed

: 7.80...8.00 travel mm

5th speed rpm: 1350

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 850 Speed Aneroid pressure h: 1000 Del.quantity : 237.0...244.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testing:

1st rack travel in: 12.70

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

Speed rpm: 1140...1170 4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

rpm : 100 Speed Minimum rack trave: 8.50

Speed rpm : 250 Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

rpm : 275...385 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rom hPa : 1000 Pressure

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 11.00...11.20 2nd pressure hPa : 460 Rack travel in m: 13.00...13.10

3rd pressure hPa : 310 Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/ : 165.0...167.0 1000 s: (162.0...170.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.70

rpm : 1030...1040 Speed

LOW IDLE

: 250 Speed rpm

Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

J02

Note remarks

: DAF 11,7 L Test sheet : 27.09.91 Edition : 18.2.91 Replaces : ISO-4113 Test oil

: 0 402 646 912 Combination no.

Injection pump

Pump designation : PE6P120A320RS7218 : 0 412 626 839 EP type number

Governor

Governor design. : RQ250/1000PA936-1 : 0 421 801 508 Governer no.

Customer-spec. information : DAF Customer

: WS 268 G Engine

1st version kW : 268.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 089 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.30...5.40 Prestroke mm : (5.25...5.45)

Rack travel in mm : 14.50...15.50 Firing order : 1-5-3-6-2-4

Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.5 Spread

100 s: (0.9)

rpm : 250.02nd speed Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 2.8...3.4

100 s: (2.5...3.7)

cm3 : 0.8 Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550 Speed Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 1000

: 234.0...236.0 Del.quantity

1000 : (231.0...239.0) : 5.00 cm3

Spread 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 550 Speed Rack travel in mm: 16.4

Testing:

1st rack travel in: 14.00

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1140...1170 4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 5.0

Testing:

rpm : 100 Speed Minimum rack trave: 6.50

Speed rpm : 250
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00

: 310...350 Speed man

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 15.30...15.40 and speed rpm : 1000 Rack travel in m: 15.20...15.40

2nd speed rpm

Aneroid/Altitude

Compensator Test

1st version

Setting

: 600 rpm : 600 hPa : 1000 Speed

Pressure

: 15.00...15.10 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 480

Rack travel in m: 14.20...14.30

3rd pressure hPa : 330 Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

104

Del.quantity cm3/: 164.0...166.0

1000 s: (161.0...169.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 14.00

rpm : 1035...1050 Speed

LOW IDLE

: 250 Speed rpm

Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MB 9,6 q Test sheet : 21.08.91 Edition : 26.7.91 Replaces : ISO-4113 Test oil

: 0 402 646 915 Combination no.

Injection pump

Pump designation : PE6P120A320LS7836 EP type number : 0 412 626 840

Governor

Governor design. : RQ300/1050PA972 Governer no. : 0 421 801 542

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M401 LA Engine

: 200.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening |

pressure, bar : 207...210

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasing

-360

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.5...5.8

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 800

: 182.0...184.0 Del.quantity 1000 : (179.0...187.0)

: 5.00 cm3

Spread : (9.00) 1000

RATED SPEED

1st version

Setting point:

: 600 Speed rom Rack travel in mm : 20.0

1st rack travel in: 12.10 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1300 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring Speed nom : 300 Rack travel in mm: 5.6 Testing: Speed rpm Minimum rack trave: 7.50 Speed rpm : 300
Rack travel in mm : 5.50...5.80
Rack travel in mm : 2.00 rom : 380...420 Aneroid/Altitude Compensator Test 1st version Setting : 600 rpm Speed hPa : 800 Pressure Rack travel mm : 12.40...12.60 Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 10.20...10.40 2nd pressure hPa : 500 Rack travel in m: 11.60...11.80

3rd pressure hPa : 1000

Rack travel in m: 12.60...12.80

4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 9.50...9.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 1050 Del.quantity cm3/ : 201.0...204.0 1000 s: (198.0...207.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1400 Speed rpm : 800 Del.quantity cm3/: 202.0...206.0 1000 s: (199.0...209.0)

Testing:

Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) Spread cm3: 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than full load rack tr: 12.10 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 9.50...9.80

Remarks:

Note remarks

: MB 9,6 o Test sheet : 30.08.91 Edition : 24.4.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 917

Injection pump

Pump designation : PE6P120A320LS7834 EP type number : 0 412 626 841

Governor

Governor design. : RQ300/950PA971 : 0 421 801 543 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M401 LA Engine

: 230.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

8.0: diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm: 14.50...14.70

Del.quantity cm3/: 22.7...22.9

100 s: (22.4...23.2)

cm3 : 0.5 Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 6.3...6.9

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1100

Del.quantity : 227.0...232.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rom Rack travel in mm: 20.0 Testing:

ist rack travel in: 13.90

rpm : 990...1005 Speed

2nd rack travel in: 4.00

Speed rpm : 1065...1095 4th rack travel in: 1200

rpm : 0.00...1.50 Speed

LOW IDLE 1

Setting point w/out bumper spring

: 300 rpm Rack travel in mm: 6.6

Testing:

: 200 Speed rpm Minimum rack trave: 8.50

: 300 Speed rpm Rack travel in mm : 6.30...6.90

Rack travel in mm: 2.00

Speed nom : 380...420

TORQUE CONTROL

: 0.35 Dimension a mm : 950 2nd speed rom

Rack travel in m: 14.90...15.10 d speed rpm : 800

3rd speed rpm

Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version Setting

: 600 Speed rpm hPa : 1100 Pressure

: 14.50...14.70 Rack travel mm

Measurement

 $1/\min : 600$ Speed

1st pressure hPa : 300 Rack travel in m: 10.70...10.90 2nd pressure hPa : 700

Rack travel in m: 13.20...13.40

3rd pressure hPa : 1400

Rack travel in m: 14.60...14.80 \*
4th pressure hPa : 1550

Rack travel in m: 14.90...15.10

5th pressure hPa : -

Rack travel in m: 9.30...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800 : 950 Speed rom

Del.quantity cm3/: 236.0...239.0 1000 s: (233.0...242.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1800

: 800 Speed rpm Del.quantity cm3/: 243.0...247.0

1000 s: (240.0...250.0)

: 8.00 Spread cm3

1000 s: (12.0)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

rpm : 990...1005 Speed

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 9,6 o 3 Test sheet : 30.08.91 : 26.4.91 Edition Replaces : ISO-4113 Test oil

: 0 402 646 929 Combination no.

Injection pump

Pump designation : PE6P12OA320LS7834 : 0 412 626 841 EP type number

Governor

: RQV300...1050PA797 Governor design.

-25

: 0 421 813 924 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M401 LA

ist version kW : 230.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 : (5.45...5.65) Prestroke mm

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.70...14.90

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 6.5...7.1

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed travel mm : 1.0...1.5

: 608 2nd speed rpm : 4.8...5.3 travel mm

: 820 3rd speed rpm

: 5.9...6.4 travel mm

1108 4th speed man : 8.3...8.8 travel mm

: 1183 5th speed rpm

: 9.8...10.3 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1085 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 14.90...15.00 4th pressure hPa : 1550 Rack travel in m: 15.10...15.30 1st version rpm : 600 Speed Aneroid pressure h: 1100 : 229.0...231.0 Del.quantity 1000 : (226.0...234.0) : 5.00 cm3Spread START CUT-OUT 1000 : (9.00) Speed RATED SPEED 1st version Control Lever position degrees: 120...128 1st version Testing: 1st rack travel in: 13.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1175...1205 4th rack travel in: 1300 Speed rpm : 0.00...1.00 Spread Speed LOW IDLE 1 Control lever position degrees: 87...92 Spread Testing: : 200 Speed rpm Minimum rack trave: 8.70 : 300 man Rack travel in mm : 6.50...7.10 Spread CONSTANT REGULATION rpm : 300...450 Speed BREAKAWAY TORQUE CONTROL Dimension a mm 1st version : 0.40 2nd speed rpm : 1050 Rack travel in m: 14.90...15.10 3rd speed rpm : 800 Rack travel in m: 15.30...15.50 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 1100 Remarks: Pressure : 14.70...14.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 10.50...10.70 2nd pressure hPa : 700 Rack travel in m: 13.40...13.60

5th pressure hPa : -Rack travel in m: 9.70...10.00 1/min : 240 (260) FUEL DELIVERY CHARACTERISTICS Aneroid pressure h: 1800 rpm : 1050 Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0) cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1800 rpm : 800 Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0) cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.001000 s: (12.0) 1mm rack travel less than full load rack tr: 13.90 rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

3rd pressure hPa : 1400

Note remarks

Test sheet : DAF 11.7 n Edition : 27.09.91 Replaces : 3.5.91

Test oil : ISO-4113

Combination no. : 0 402 646 936

Injection pump

Pump designation : PE6P12OA32ORS7230 EP type number : 0 412 626 843

Governor

Governor design. : RQV250...1000PA990K

Governer no. : 0 421 815 274

Customer—spec. information Customer : DAF

Engine : WS 315 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 13.80...14.80

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 980

Rack travel in mm : 14.20...14.30

Del.guantity cm3/: 26.4...26.6

100 s: (26.1...26.9)

Spread cm3: 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.30...1.70

2nd speed rpm: 285

travel mm : 2.10...2.50

3rd speed rpm : 1030

travel mm : 9.60...10.00

4th speed rpm: 1145

travel mm : 11.20...11.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 1500

Del.quantity : 264.0...266.0

1000 : (261.0...269.0) d cm3 : 5.00

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

111

1st version Control lever position degrees: 60...68 Testina: 1st rack travel in: 13.20 Speed rpm : 1030...1040 2nd rack travel in: 4.00 Speed rpm : 1130...1160 4th rack travel in: 1275 rpm : 0.00...1.40 Speed LOW IDLE 1 Control lever position degrees: 16...24 Testing: : 100 Speed nom Minimum rack trave: 6.70 rpm : 250 Speed Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 Speed rpm : 310...350 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm: 500
Rack travel in m: 13.00...13.10 nd speed rpm : 600 Rack travel in m: 13.00...13.20 2nd speed 3rd speed rpm : 750 Rack travel in m: 13.30...13.50 4th speed rpm : 825 Rack travel in m: 13.80...14.00 5th speed rpm : 980 Rack travel in m: 14.80...15.00 Aneroid/Altitude Compensator Test 1st version Setting : 980 Speed nom hPa : 1500 Pressure Rack travel mm : 14.20...14.30 Measurement 1/min: 980 Speed 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 630 Rack travel in m: 11.80...11.90 3rd pressure hPa : 340 Rack travel in m: 9.90...10.10

# BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.20 Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.10...5.30

Remarks:

FUEL DELIVERY CHARACTERISTICS

Note remarks

: DAF 11,7 L2 : 27.09.91 : 21.6.91 Test sheet Edition Replaces : ISO-4113 Test oil

: D 402 646 941 Combination no.

Injection pump

Pump designation : PE6P120A320RS7218Z

: 0 412 626 847 EP type number

Governor

Governor design. : RQ250/1000PA936-1 : 0 421 801 508 Governer no.

Customer-spec. information Customer : DAF

: WS 222 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.30...5.40 Prestroke mm

: (5.25...5.45)

Rack travel in mm : 13.10...14.10

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 13.1...14.1 Difference ° CS : 2.25...3.75

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 19.6...19.8

100 s: (19.3...20.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm: 550 Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 1000

Del.quantity : 190.0...201.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 550 Speed Rack travel in mm: 15.8

Testing: 1st rack travel in: 12.60 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1250 rom : 0.00...1.40Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 250 Rack travel in mm : 5.0 Testing: : 100 Speed rom Minimum rack trave: 6.50 rpm : 250 Speed Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00 Speed rpm : 310...350 TORQUE CONTROL Dimension a mm : -Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 14.60...14.70 2nd speed rpm : 990 Rack travel in m: 14.50...14.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 13.60...13.70 Rack travel inm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 12.30...12.50 2nd pressure hPa : 390 Rack travel in m: 13.30...13.40 3rd pressure hPa : 310 Rack travel in m: 12.70...12.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 161.0...163.0 1000 s: (158.0...166.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.60 Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Remarks:

Note remarks

: MB 11,1 d : 18.09.91 Test sheet Edition : 27.5.91 Replaces : ISO-4113 Test oil

: 0 402 646 942 Combination no.

Injection pump

Pump designation : PE6P12OA320LS7837 EP type number : 0 412 626 842

Governor

Governor design. : RQ300/1050PA993 : 0 421 801 581 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M441 LA Engine

: 250.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasina

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.70...14.90

Del.guantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 6.0...6.6 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

Aneroid pressure h: 1000

: 234.0...236.0 Del.quantity

1000 : (231.0...239.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 20.0

Testing: 1st rack travel in: 14.00 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW TDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.3 Testing: Speed rpm : 200 Minimum rack trave: 8.10 : 300 Speed rpm Rack travel in mm : 6.00...6.60 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL mension a mm : ?

nd speed rpm : 1050

Rack travel in m: 15.00...15.20 Dimension a mm 2nd speed rpm 3rd speed rpm : 800 Rack travel in m: 15.50...15.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 14.70...14.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 200 Rack travel in m: 9.70...9.90 2nd pressure hPa : 600
Rack travel in m: 13.50...13.70
3rd pressure hPa : 1250
Rack travel in m: 14.80...15.00 \*
4th pressure hPa : 1400 Rack travel in m: 15.30...15.50 5th pressure hPa : -Rack travel in m: 9.30...9.50 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1800 : 1050 Speed rom Del.quantity cm3/: 235.0...238.0 1000 s: (232.0...241.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1800 Speed rpm : 800 Del.quantity cm3/ : 248.0...252.0 1000 s: (245.0...255.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 135.0...137.0 1000 s: (132.0...140.0) cm3 : 8.00Spread 1000 s: (12.0)

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1090...1105

### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

#### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: UNI 13,8 h1 Test sheet : 18.09.91 Edition : 22.3.91 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 946

Injection pump

Pump designation : PE6P130A720RS7225 : 0 412 636 817 EP type number

Governor

Governor design. : RQV300...975PA1002K

: 0 421 815 279 Governer no.

Customer-spec. information : IVECO-UNIC Customer

: 8210.42.009 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...21C pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5,15)

Rack travel in mm : 11.50...12.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 975 1st speed

Rack travel in mm : 11.90...12.00

Del.guantity cm3/: 26.9...27.2

100 s: (26.5...27.5)

cm3 : 0.6Spread

100 s: (1.0)

2nd speed rpm : 300.0 Rack travel in mm : 3.8...4.2 Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

cm3 : 1.0 Spread 100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1020: 9.90...10.10 travel mm

2nd speed rpm : 300

: 1.60...2.00 travel mm

3rd speed rpm : 400

: 3.40...4.00 travel mm

4th speed rpm : 600

: 5.20...5.60 travel mm

rpm : 1250 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1045

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 900 Del.quantity : 269.0...272.0 1000 : (265.5...275.5)

cm3 : 6.00 Spread

1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 114...122

lesting:

1st rack travel in: 10.90

: 1015...1025 Speed

2nd rack travel in: 4.00

rpm : 1075...1105 Speed

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 66...74

Testing:

rpm : 100 Speed Minimum rack trave: 5.40

Speed rpm : 300 Rack travel in mm : 3.90...4.10

CONSTANT REGULATION

rpm : 280...400 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 975

Rack travel in m: 11.90...12.00

: 800 2nd speed rpm

Rack travel in m: 11.60...11.80

rpm : 500 3rd speed

Rack travel in m: 10.50...10.90

Aneroid/Altitude

Compensator Test

1st version

Setting

: 975 Speed man hPa : 900 Pressure

: 11.90...12.00 Rack travel mm

Measurement

1/min: 975 Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 490

Rack travel in m: 11.20...11.30

3rd pressure hPa : 290

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 500 Del.quantity cm3/ : 245.0...253.0 1000 s: (241.5...256.5)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 196.0...199.0 1000 s: (192.5...202.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1015...1025 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 125.0...155.0

1000 s: (121.0...159.0)

LOW IDLE

Speed rpm: 300 Rack travel in mm: 3.80...4.20 Del.quantity cm3/: 19.0...25.0 1000 s: (15.0...29.0)

cm3 : 10.00 Spread

1000 s: (14.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : UNI 13,8 h2 : 08.10.91 Edition : 22.3.91 Replaces : ISO-4113 Test oil

: 0 402 646 947 Combination no.

Injection pump

Pump designation : PE6P130A720RS7225 : 0 412 636 817 EP type number

Governor

: RQV300...950PA1002-1 Governor design.

: 0 421 815 280 Governer no.

Customer-spec. information Customer : IVECO-UNIC

Engine : 8210.42.400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 12.50...13.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 950 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 30.6...30.9

100 s: (30.2...31,2)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 300.0 2nd speed Rack travel in mm : 3.3...3.7 Del.quantity cm3/: 1.9...2.5

100 s: (1.5...2.9)

cm3 : 1.0Spread 100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm travel mm

8.50...8.70 2nd speed 300 rpm

1.00...1.40 travel mm

500 3rd speed rom

3.30...3.90 travel mm

750 4th speed ngn

5.80...6.20 travel mm

1300 5th speed rom

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 950 Speed

Aneroid pressure h: 900

Del.quantity : 306.0...309.0

1000 : (302.5...312.5)

cm3 : 6.00 1000 : (10.00) cm3 Spread RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 11.50 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1090...1120 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 62...70 Testing: : 100 Speed rom Minimum rack trave: 5.00 Speed rpm : 300 Rack travel in mm : 3.40...3.60 CONSTANT REGULATION rpm : 340...460 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 12.50...12.60 2nd speed rpm : 750 Rack travel in m: 12.40...12.60 3rd speed rpm : 500 Rack travel in m: 11.20...11.40 4th speed rpm : 300 Rack travel in m: 10.80...11.10 Aneroid/Altitude Compensator Test 1st version Setting : 950 Speed rom hPa : 900 Pressure Rack travel mm : 12.50...12.60 Measurement 1/min: 950 Speed 1st pressure hPa : -Rack travel in m: 8.60...8.80

START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Ancroid pressure h: 900 Speed rpm : 500 Del.quantity cm3/: 273.0...279.0 1000 s: (266.5...282.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 195.0...198.0 1000 s: (191.5...201.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 125.0...155.0 1000 s: (121.0...159.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 3.30...3.70 Del.quantity cm3/: 19.0...25.0 1000 s: (15.0...29.0) cm3 : 10.00 Spread 1000 s: (14.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Rack travel in m: 9.40...9.80

2nd pressure hPa : 560

3rd pressure hPa : 350

Rack travel in m: 11.30...11.40

Note remarks

: PEN 7,2 a : 21.08.91 : 26.7.91 Test sheet Edition Replaces Test oil : ISO-4113

Combination no. : 0 402 646 948

Injection pump

Pump designation: PE6P120A320RS7233-1 : 0 412 626 849

EP type number

Governor

Governor design. : RQV300...1300PA1003K

: 0 421 815 281 Governer no.

Customer-spec. information : PENTA Customer

Engine : TAMD 72 A

1st version kW : 316.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40 : (3.25...3.45)

Rack travel in mm : 9.00...12.00

: 1-5- 3- 6- 2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 14.60...14.70

Del.quantity cm3/: 27.0...27.2

100 s: (26.7...27.5)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 300.0 2nd speed Rack travel in mm : 5.9...6.2 Del.quantity cm3/: 2.0...2.6

100 s: (1.7...2.7)

cm3 : 0.7Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

2.00...2.40 travel mm

: 550 2nd speed rom

4.00...4.60 travel mm

1000 3rd speed rpm

7.00...7.60 travel mm 1350

4th speed rpm 10.10...10.30 travel mm

rpm : 14305th speed

: 10.90...11.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1500 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300Speed Aneroid pressure h: 2000

: 270.0...272.0 1000 : (267.0...275.0) Del.quantity

: 6.00 cm3 Spread 1000 : (10.00)

RATED SPEED

1st version

Control lever position degrees: 118...126

Testina:

1st rack travel in: 13.60

rpm : 1330...1340 Speed

2nd rack travel in: 4.00

rpm : 1460...1490 Speed

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 71...79

Testing:

: 100 Speed rpm Minimum rack trave: 7.00

Speed rom

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 300...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1300 1st speed

Rack travel in m: 14.60...14.70

: 1200 2nd speed rom

Rack travel in m: 14.00...14.30

rpm : 1000 3rd speed

Rack travel in m: 12.50...13.00

4th speed rpm : 800

Rack travel in m: 12.10...12.30

Aneroid/Altitude

Compensator Test

1st version

Settina

: 1300 Speed rom hPa : 2000 Pressure

: 14.60...14.70 Rack travel mm

Measurement

1/min: 1300 Speed

1st pressure hPa : -Rack travel in m: 7.20...7.50

2nd pressure hPa : 350

Rack travel in m: 7.40...7.50 3rd pressure hPa : 1260

Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000 : 800 Speed rpm

Del.quantity cm3/: 251.0...257.0 1000 s: (248.0...260.0)

cm3 : 9.00 Spread 1000 s: (13.0)

Aneroid pressure h: -

: 800 Speed rpm

Del.quantity cm3/: 125.0...127.0 1000 s: (122.0...130.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.60

rpm : 1330...1340 Speed

LOW IDLE

Speed rpm

Rack travel in mm : 5.40...5.60

Remarks:

Start-of-delivery setting with ROBO

diaphragm.

Note remarks

: DAF 11,7 n1 Test sheet : 27.09.91 Edition

: 21.6.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 949

Injection pump

Pump designation : PE6P120A320RS7230Z

: 0 412 626 848 EP type number

Governor

Governor design. : RQV250...1000PA990K

: 0 421 815 274 Governer no.

Customer-spec. information

: DAF Customer

: WS 295 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening 1 4 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 13.20...14.20

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 980 1st speed

Rack travel in mm : 13.70...13.80

Del.guantity cm3/: 25.4...25.6

100 s: (25.1...25.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.30...1.70 travel mm

rpm : 285 2nd speed

: 2.10...2.50 travel mm

: 1030 3rd speed rpm

: 9.60...10.00 travel mm

: 1145 4th speed rpm

: 11.20...11.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1070 Speed

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 980 Speed Aneroid pressure h: 1500

Anerola ... Del.quantity 1000 : 254.0...256.0 : (251.0...259.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 12.70 Speed rpm : 1030...1040 2nd rack travel in: 4.00 Speed rpm : 1135...1165 4th rack travel in: 1275 rpm : 0.00...1.40 Speed LOW IDLE 1 Control lever position degrees: 65...73 Testing: rpm : 100 Speed Minimum rack trave: 6.70 Speed rpm : 250
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 320...360 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 500 Rack travel in m: 12.20...12.30 ad speed rpm : 550 Rack travel in m: 12.20...12.40 ad speed rpm : 725 Rack travel in m: 12.60...12.80 at speed rpm : 850 2nd speed 3rd speed 4th speed Rack travel in m: 13.20...13.40 5th speed rpm : 980 Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Setting rom : 980 hPa : 1500 Speed MC Pressure : 13.70...13.80 Rack travel mm Measurement 1/min: 980 Speed 1st pressure hPa : -Rack travel in m: 8.10...8.30 2nd pressure hPa : 430
Rack travel in m: 10.80...10.90
3rd pressure hPa : 190 Rack travel in m: 9.10...9.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 500
Del.quantity cm3/: 263.0...267.0
1000 s: (260.0...270.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: Speed rpm : 600
Del.quantity cm3/: 143.0...145.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.70 Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.10...5.30

Remarks:

:

Note remarks

: MB 9,6 q 6 Test sheet Edition : 08.10.91

Replaces

: ISO-4113 Test oil

: 0 402 646 952 Combination no.

Injection pump

Pump designation : PE6P120A320LS7836 EP type number : 0 412 626 840

Governor

Governor design. : RQ300/1050PA972-8

: 0 421 801 626 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M401 LA Engine

: 180.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0.8 diameter mm

Test lines : 1 680 750 075

Outside diameter x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 11.70...11.90

Del.guantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 100 s: (1.0) Spread

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 700

: 164.0...166.0 Del.quantity

1000 : (161.0...169.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 20.0 Testing:

1st rack travel in: 11.30

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

Speed rpm : 1165...1195 4th rack travel in: 1300

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

: 300 Speed rpm Rack travel in mm: 5.6

Testina:

rpm Speed Minimum rack trave: 7.40

Speed rpm: 300
Rack travel in mm: 5.30...5.90
Rack travel in mm: 2.00
Speed rpm: 370...410

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 700 Pressure

: 11.70...11.90 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : 300 Rack travel in m: 10.20...10.40

2nd pressure hPa : 400

Rack travel in m: 11.10...11.30

3rd pressure hPa : 900

Rack travel in m: 11.80...12.00 \*

4th pressure hPa : -

Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

Speed rpm : 1050 Del.quantity cm3/ : 182.0...185.0 1000 s: (179.0...188.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: 1400

: 800 Speed rpm

Del.quantity cm3/: 186.0...190.0

1000 s: (183.0...193.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: rpm : 500

Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0)

cm3 : 8.00 Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

: 100 rpm Speed

Rack travel in mm : 10.00...10.30

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 9,6 q 7 Test sheet : 08.10.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 953

Injection pump

Pump designation : PE6P12OA32OLS7836

EP type number

: 0 412 626 840 Governor

Governor design. : RQ300/950PA971-8 : 0 421 801 625 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M401 LA Engine

: 180.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.5 Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.9

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 700

Del.quantity

: 164.0...166.0 1000 : (161.0...169.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed Rack travel in mm : 20.0

Testina: 1st rack travel in: 11.50 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1100 rom : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300° Rack travel in mm: 5.6 Testina: : 200 Speed mon Minimum rack trave: 7.40 : 300 Speed rpm Rack travel in mm : 5.30...5.90 Rack travel in mm : 2.00 : 370...410 LDW Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure : 11.70...11.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 10.20...10.40 2nd pressure hPa : 400 Rack travel in m: 11.10...11.30 3rd pressure hPa : 900 Rack travel in m: 11.80...12.00 \* 4th pressure hPa : 1100 Rack travel in m: 12.20...12.40 5th pressure hPa : -Rack travel in m: 9.80...10.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 : 950 Speed rpm Del.quantity cm3/: 187.0...190.0 1000 s: (184.0...193.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1400

: 800

1000 s: (187.0...197.0)

rpm Del.quantity cm3/: 190.0...194.0

cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00 Spread

1000 s: (12.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.50 rpm : 990...1005 Speed

STARTING FUEL DELIVERY

: 100 rom Rack travel in mm : 10.00...10.30

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

Note remarks

Test sheet : MB 9,6 o 6 Edition : 27.09.91

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 646 954

Injection pump

Pump designation : PE6P120A320L\$7834

EP type number : 0 412 626 841

Governor

Governor design. : RQ300/1050PA993-5

Governer no. : 0 421 801 610

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65) Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.70...13.90

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 6.4...7.0 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 800

Del.quantity : 209.0...211.0 1000 : (206.0...214.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing: 1st rack travel in: 13.10 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1175...1205 4th rack travel in: 1300 Speed rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring : 300 Speed rpm Rack travel in mm: 6.7 Testina: Speed rpm : 200 Minimum rack trave: 8.50 : 300 Speed rpm Rack travel in mm : 6.40...7.00 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 14.10...14.30 3rd speed rpm : 800 Rack travel in m: 14.30...14.50 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 800 Pressure : 13.70...13.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 9.90...10.10 2nd pressure hPa : 550
Rack travel in m: 12.50...12.70
Rack travel in m: 13.80...14.00 \*
4th pressure hPa : 1250

Rack travel in m: 14.10...14.30

FUEL DELIVERY CHARACTERISTICS

: Rack travel in m: 9.20...9.50

1/min: 220 (240)

5th pressure hPa

START CUT-OUT

1st version Aneroid pressure h: 1500 Speed rpm : 1050 Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 219.0...223.0 1000 s: (216.0...226.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.10 peed rpm : 1090...1105 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) Remarks: \* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

Note remarks

Test sheet : MB 9,6 o 5 Edition : 20.09.91

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 646 955

Injection pump

Pump designation : PE6P120A320LS7834-1

EP type number : 0 412 626 857

Governor

Governor design. : RQV350...1050PA866

-13

Governer no. : 0 421 813 954

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 230.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65) Rack travel in mm : 20.00...21.00

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 22.2...22.4

100 s: (21.9...22.7)

Spread cm3: 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 350

travel mm : 1.40...1.60 travel mm : 3.90...4.30 travel mm : 6.80...7.20

4th speed rpm : 1200

travel mm : 8.50...9.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm: 1130

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 900

**KO3** 

: 222.0...224.0 Del.quantity

1000 : (219.0...227.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control Lever

position degrees: 117...125

Testing:

1st rack travel in: 13.70

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 63...71

Testing:

Speed rpm Minimum rack trave: 7.30 : 350 Speed COM

Rack travel in mm : 5.10...5.70

CONSTANT REGULATION

rpm : 350...600 Speed

TORQUE CONTROL

Dimension a mm : 0.40 : 1050 2nd speed rpm

Rack travel in m: 14.80...15.00

: 800 3rd speed rpm

Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version Settina

Speed MC

: 600 hPa : 900 Pressure

: 14.60...14.80 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : 300 Rack travel in m: 11.40...11.60

2nd pressure hPa : 600 Rack travel in m: 13.40...13.60

3rd pressure hPa : 1350

Rack travel in m: 14.70...14.90 \*

4th pressure hPa

Rack travel in m: 9.60...9.90

START CUT-OUT

Speed 1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800 : 1050 Speed rpm

Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0)

cm3 : 8.00 Spread

1000 s: (12.0) Aneroid pressure h: 1800 : 800 Speed rpm

Del.quantity cm3/: 241.0...245.0

1000 s: (238.0...248.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm

Del.quantity cm3/: 125.0...127.0 1000 s: (122.0...130.0)

cm3 : 8.00Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 250.0...270.0

1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 11,1 b 2 : 08.10.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 956

Injection pump

Pump designation: PE6P120A320LS7837-1

EP type number : 0 412 626 858

Governor

Governor design. : RQV350...1050PA842-9

: 0 421 813 955 Governer no.

Customer-spec, information

: MERCEDES-BENZ Customer

Engine : 0M441 LA

: 250.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.05)

Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.50...14.70

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 350

: 1.40...1.60 travel mm : 3.90...4.30 travel mm

: 6.80...7.20 travel mm

rpm : 1200 4th speed

: 8.50...9.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1185 Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1000

: 234.0...236.0 1000 : (231.0...239.0) Del.quantity : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 111...119 Testing: 1st rack travel in: 13.50 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1300 Speed rom : 0.00...1.00LOW IDLE 1 Control lever position degrees: 63...71 Testing: : 200 Speed rpm Minimum rack trave: 7.30 **LDW** : 350 Rack travel in mm : 5.10...5.70 CONSTANT REGULATION rpm : 350...600 Speed TORQUE CONTROL Dimension a mm : 0.60 2nd speed rpm : 1050 Rack travel in m: 14.50...14.70 : 950 rpm 3rd speed Rack travel in m: 14.80...15.00 : 800 4th speed rom Rack travel in m: 15.10...15.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 **CDM** Pressure hPa : 1000 : 14.50...14.70 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 200 Rack travel in m: 9.60...9.80 2nd pressure hPa : 600 Rack travel in m: 13.30...13.50

3rd pressure hPa : 1250

Rack travel in m: 14.60...14.80 \*

4th pressure hPa : 1400 Rack travel in m: 15.10...15.30 5th pressure hPa : -Rack travel in m: 8.70...8.90 START CUT-OUT 1/min : 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1800 : 1050 Speed rpm Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1800 Speed : 800 rpm Del.quantity cm3/: 247.0...251.0 1000 s: (244.0...254.0) : 8.00 Spread cm3 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 135.0...137.0 1000 s: (132.0...140.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.50 Speed rpm : 1090...1100 STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 250.0...270.0 1000 s: (246.0...274.0) Remarks: \* Increase in control-rod travel with

respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 9,6 r 2 30.08.91 Edition 2.8.91 Replaces : ISO-4113 Test oil

: 0 402 646 957 Combination no.

Injection pump

Pump designation : PE6P120A320LS7836 : 0 412 626 840 EP type number

Governor

: RQV300...1050PA797 Governor design.

-32

Governe no. : 0 421 813 957

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 180.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 0.50...1.00 travel mm 2nd speed : 830 man

travel mm : 5.90...6.40

: 1107 3rd speed man travel mm : 8.10...8.60

1190 4th speed rom

9.80...10.30 travel mm

1290 5th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

**K07** 

1st version

Speed rpm : 600 Aneroid pressure h: 700

: 164.0...166.0 Del.quantity 1000 : (161.0...169.0) cm3 : 5.00

Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 11.30 Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1165...1195

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 78...86

Testing:

: 200 Speed rpm Minimum rack trave: 7.40 Speed rpm : 300

Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

: 300...400 Speed rpm

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm hPa : 700 Pressure

Rack travel mm : 11.70...11.90

Measurement

1/min: 600 Speed

1st pressure hPa : 250 Rack travel in m: 10.30...10.50

2nd pressure hPa : 400

Rack travel in m: 11.10...11.30

3rd pressure hPa : 900

Rack travel in m: 11.80...12.00 \*

4th pressure hPa : 1100

Rack travel in m: 12.10...12.30

5th pressure hPa : -

Rack travel in m: 10.00...10.30

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400 rpm : 1050 Speed

Del.quantity cm3/: 182.0...185.0

1000 s: (179.0...188.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -Speed : 500 rpm

Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0)

Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rom

Del.quantity cm3/: 200.0...220.0

1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 9.6 r 3 : 30.08.91 Test sheet Edition : 2.8.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 958

Injection pump

Pump designation : PE6P120A320LS7836 EP type number : 0 412 626 840

Governor

Governor design. : RQV300...950PA797-33

: 0 421 813 958 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M401 LA

1st version kW : 180.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00X2.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 5.3...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

1.00...1.50 travel mm

rpm : 780 2nd speed travel mm

: 6.10...6.60

rpm : 1008 3rd speed

: 8.30...8.80 travel mm

rpm : 1092 4th speed

: 11.00...10.30 travel mm

rpm : 1190 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-Lever position Degree: -1

rpm : 1020 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 700 : 164.0...166.0 Del.quantity 1000 : (161.0...169.0) : 5.00 Spread cm31000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 114...122 Testing: 1st rack travel in: 11.50 rpm : 990...1000 Speed 2nd rack travel in: 4.00 : 1065...1095 Speed rpm 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 78...86 Testina: Speed : 200 man Minimum rack trave: 7.40 : 300 m<sub>C</sub> Rack travel in mm : 5.30...5.90 CONSTANT REGULATION rpm : 300...450 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed man hPa : 700 Pressure : 11.70...11.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 10.30...10.50 2nd pressure hPa : 400 Rack travel in m: 11.10...11.30 3rd pressure hPa : 900 Rack travel in m: 11.80...12.00 \* 4th pressure hPa : 1100 Rack travel in m: 12.10...12.30 5th pressure hPa : -Rack travel in m: 10.00...10.30 START CUT-OUT

K10

1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 950 Del.quantity cm3/ : 187.0...190.0 1000 s: (184.0...193.0) : 8.00 Spread cm31000 s: (12.0) Aneroid pressure h: 1400 : 800 Speed rpm Del.quantity cm3/: 189.0...193.0 1000 s: (186.0...196.0) Spread cm3 : 8.00 1000 s: (12.0) Ameroid pressure h: -Speed : 500 rpm Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0) Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 9,6 q 4 : 30.08.91 : 2.8.91 Edition Replaces Test oil : ISO-4113

: 0 402 646 959 Combination no.

Injection pump

Pump designation : PE6P12OA32OLS7836

EP type number : 0 412 626 840

Governor

Governor design. : RQ300/1050PA993-6

Governer no. : 0 421 801 616

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M401 LA Engine

: 200.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.5...5.8 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 10c.u...187.0)

Spread cm3

: 5.00 : (9.00) 1000

RATED SPEED

1st version

Setting point:

Speed rom Rack travel in mm: 20.0

1st rack travel in: 12.10 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 Speed rpm : 1165...1195 4th rack travel in: 1300 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm Rack travel in mm: 5.6 Testing: Speed rpm : 200 Minimum rack trave: 7.50 Speed rpm : 300
Rack travel in mm : 5.50...5.80
Rack travel in mm : 2.00 Speed rpm : 380...420 Ameroid/Altitude Compensator Test 1st version Setting : 600 Speed LD(I) hPa : 800 Pressure : 12.40...12.60 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 10.20...10.40 2nd pressure hPa : 500 Rack travel in m: 11.60...11.80 3rd pressure hPa : 1000 Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 9.50...9.80 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 1050 Del.quantity cm3/ : 201.0...204.0 1000 s: (198.0...207.0) Spread cm3 : 8.00 1000 s: (12.0)

Testing:

Aneroid pressure h: 1400

Speed rpm : 800

Del.quantity cm3/: 202.0...206.0

1000 s: (199.0...209.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 
Speed rpm : 500

Del.quantity cm3/: 122.0...124.0

1000 s: (119.0...127.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.10 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

K12

Note remarks

: MB 9,6 q 5 : 30.08.91 : 2.8.91 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 960

Injection pump

Pump designation : PE6P120A320LS7836 : 0 412 626 840 EP type number

Governor

Governor design. : RQ300/950PA993-7 Governer no. · 0 421 801 617

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M401 LA Engine

: 200.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 ist speed

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 5.3...5.9

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 800

Del.quantity : 182.0...184.0 1000 : (179.0...187.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rom Rack travel in mm: 20.0

Testina: 1st rack travel in: 12.10 Speed rpm : 990...1005 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 Speed rom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.6 Testing: Speed rpm : 200 Minimum rack trave: 7.40 Speed rpm : 300 Rack travel in mm: 5.30...5.90
Rack travel in mm: 2.00
Speed rpm: 370...410 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rom hPa : 800 Pressure : 12.40...12.60 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.20...10.40 2nd pressure hPa : 500 Rack travel in m: 11.60...11.80 3rd pressure hPa : 1000 Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : Rack travel in m: 10.00...10.30 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 rpm : 950 Speed Del.quantity cm3/: 203.0...206.0

1000 s: (200.0...209.0)

cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1400

Speed rpm : 800

Del.quantity cm3/ : 202.0...206.0

1000 s: (199.0...209.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 
Speed rpm : 500

Del.quantity cm3/ : 122.0...124.0

1000 s: (119.0...127.0)

Spread cm3 : 8.00

1000 s: (12.0)

### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.10 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

Spread

Note remarks

: PEN 16,2 c Test sheet : 08.10.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 962

Injection pump

Pump designation : PE6P130A720RS7137

EP type number : 0 412 636 806

Governor

Governor design. : RQ750PA865-2 Governer no. : 0 421 801 619

Customer spec. information Customer : PENTA

: TWD1620G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.60...3.70 Prestroke mm : (3.55...3.75)

Rack travel in mm : 9.00...12.00

K15

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.30 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.00...12.10

Del.guantity cm3/: 38.6...38.9

100 s: (38.3...39.3)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 700 2nd speed

Rack travel in mm: 3.7...4.1 Del.quantity cm3/: 2.7...3.3

100 s: (2.4...3.6)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 386.5...389.5 Del.quantity 1000 : (383.0...393.0)

cm3 : 6.00

Spread 1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 86...94

Testing:

1st rack travel in: 11.00 Speed rpm : 748...753

2nd rack travel in: 4.00

Speed rpm: 774...788 4th rack travel in: 850

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 748...753 Speed

# HIGH IDLE

1st version

Speed rpm : 700
Rack travel in mm : 3.70...4.10
Del.quantity cm3/ : 27.0...33.0
1000 s: (24.0...36.0)
Spread cm3 : 5.00
1000 s: (8.00)

Remarks:

**APPLICATION** 

Generator set

Note remarks

Test sheet

: DAF 11,7 L3

Edition

: 27.09.91

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 963

Injection pump

Pump designation : PE6P120A320RS7218Y

EP type number

: 0 412 626 859

Governor

Governor design. : RQ250/1000PA936-1

Governer no.

: 0 421 801 508

Customer-spec. information Customer

: DAF

Engine

: WS 242 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

**Opening** 

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.30...5.40

: (5.25...5.45)

Rack travel in mm : 13.70...14.70

K17

Firing order

: 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10

& maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed

rpm: 850

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 21.3...21.5

100 s: (21.0...21.8)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 250.02nd speed

Rack travel in mm : 6.6...7.0

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3) cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 850

Aneroid pressure h: 1000 Anerous ... Deliquantity 1000

: 213.0...215.0 : (210.0...218.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rpm

Rack travel in mm: 16.4

Testing: 1st rack travel in: 13.20 Speed rpm : 1035...1050 2nd rack travel in: 4.00 Speed rpm : 1140...1170 4th rack travel in: 1250 rom : 0.00...1.40 Speed LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm : 5.0 Testing: Speed rpm : 100 Minimum rack trave: 6.50 Speed rpm : 250
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 310...350 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 15.30...15.40 2nd speed rpm : 1000 Rack travel in m: 15.20...15.40 Aneroid/Altitude Compensator Test 1st version Setting

1st version Setting Speed rpm : 600 Pressure hPa : 1000 Rack travel mm : 14.20...14.30

Measurement Speed

Speed 1/min: 600

1st pressure hPa : -Rack travel in m: 12.40...12.60

2nd pressure hPa : 480

Rack travel in m: 13.80...13.90

3rd pressure hPa : 330 Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: Speed rpm : 600
Del.quantity cm3/ : 167.0...169.0
1000 s: (164.0...172.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.20 Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

Test sheet : DAF 11,7 L4 : 27.09.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 964

Injection pump

Pump designation : PE6P120A320RS7218Y EP type number : 0 412 626 859

Governor

Governor design. : RQV250...1000PA939 Governer no. : 0 421 813 829

Customer-spec. information Customer : DAF

: WS 242 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.30...5.40 Prestroke mm : (5.25...5.45)

Rack travel in mm : 13.70...14.70

K19

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack tray. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 21.3...21.5

100 s: (21.0...21.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm : 6.6...7.0 Del.quantity cm3/ : 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed : 7.80...8.00 travel mm

rpm : 250 2nd speed : 0.70...1.10 travel mm

3rd speed 400 rpm : 2.50...3.10 travel mm

700 4th speed rom

: 4.50...4.90 rpm : 1350 travel mm

5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1125 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 850 Aneroid pressure h: 1000 Del.quantity : 213.0...218.0) 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: ? Testing: 1st rack travel in: 13.20 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1150...1180 Speed 4th rack travel in: 1250 rpm : 0.00...1.40 Speed LOW IDLE 1 Control lever position degrees: 12...20 Testing: Speed : 100 mon Minimum rack trave: 6.50 rpm : 250 Speed Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 270...380 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 1000 Pressure : 14.20...14.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 12.40...12.60 2nd pressure hPa : 480 Rack travel in m: 13.80...13.90 3rd pressure hPa : 330 Rack travel in m: 12.80...13.00 FUEL DELIVERY CHARACTERISTICS

Speed rpm : 600 Del.quantity cm3/ : 167.0...169.0 1000 s: (164.0...172.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.20 Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

K20

1st version

Aneroid pressure h: -

Note remarks

: MB 14,7 a35 : 18.09.91 Test sheet Edition

Replaces

Test oil : ISO-4113

: 0 402 648 817 Combination no.

Injection pump

Pump designation : PE8P120A320LS7801 EP type number : 0 412 628 806

Governor

Governor design. : RQ300/1050PA762-16

: 0 421 801 620 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M442 A

1st version kW : 260.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mi

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.0...6.4

Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.5

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 1050

Del.quantity : 204.0...206.0 1000 : (201.0...209.0)

Spread cm3 : 4.00

1000 : (7.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.70 Speed rpm : 1095...1110 2nd rack travel in: 4.00 speed rpm : 1170...1200 4th rack travel in: 1300 Speed rpm LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.2 Testing: Speed rpm : 200 Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.00...6.40 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL : 0.75 Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 12.70...12.90 3rd speed rpm : 500 Rack travel in m: 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom Pressure hPa : -: 11.40...11.70 Rack travel mm Measurement Speed  $1/\min: 600$ 1st pressure hPa : 300 Rack travel in m: 12.30...12.50 2nd pressure hPa : 400 Rack travel in m: 13.30...13.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1050 : 1050 Speed rpm Del.quantity cm3/: 178.0...181.0

1000 s: (175.0...184.0)

Spread cm3: 7.00 1000 s: (10.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) Spread cm3: 7.00 1000 s: (10.0)

BREAKAWAY

1st version 1mm rack travel less than full load rack tr: 11.70 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 175.0...190.0 1000 s: (171.0...194.0)

Remarks:

K22

### Note remarks

Test sheet : MB 14,7 a36 Edition : 18.09.91

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump

Pump designation : PE8P12OA32OLS7801 EP type number : 0 412 628 806

Governor

: RQV300...1050PA797 Governor design.

-34

: 0 421 813 973 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M442 A Engine

1st version kW : 260.0 : 2100 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm: 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.0...6.4 Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2) cm3 : 0.5Spread

100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed 300 rpm :

1.20...1.40 travel mm

2nd speed 600 rom

travel mm 4.90...5.10 3rd speed 1075 rom

travel mm 7.40...7.60

4th speed 1100

rpm

travel mm 8.00...8.20

5th speed 1150 rpm

: 9.00...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1125 Speed

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm: 500
Ameroid pressure h: 1050
Del.quantity: 204.0...206.0 1000 : (201.0...209.0) Spread cm3 : 4.001000 : (7.00) RATED SPEED 1st version Control Lever position degrees: 114...122 Testing: 1st rack travel in: 11.70 rom : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1155...1185 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 80...88 Testing: Speed rom Minimum rack trave: 7.70 Speed rpm: 300 Rack travel in mm: 6.00...6.40 CONSTANT REGULATION rom : 300...450 Speed TORQUE CONTROL Dimension a mm : 1.40 2nd speed rpm : 1050 Rack travel in m: 12.70...12.90 3rd speed rpm : 500 Rack travel in m: 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : Rack travel mm : 11.40...11.70 Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 12.30...12.50

Rack travel in m: 13.30...13.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1050 rpm : 1050 Speed Del.quantity cm3/: 178.0...181.0 1000 s: (175.0...184.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 146.0...148.0 1000 s: (143.0...151.0) cm3 : 7.00 Spread 1000 s: (10.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 175.0...190.0 1000 s: (171.0...194.0) Remarks:

2nd pressure hPa : 400

Note remarks

: FIA 17,2 e : 27.09.91 : 28.6.91 Test sheet Edition Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 854

Injection pump

Pump designation : PE8P130A920/5LS7822

EP type number : 0 412 638 802

Governor

Governor design. : RQV300...950PA905

: 0 421 813 723 Governer no.

Customer-spec. information Customer : IVECO-FIAT

: 8280.42.001 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 688 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20

: (5.05...5.25)

Rack travel in mm : 9.00...12.00

: 1- 8- 4- 3- 6- 5-7- 2 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 550 1st speed

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 22.8...23.1

100 s: (22.4...23.4)

cm3 : 0.8Spread

100 s: (1.2)

rpm : 300.0 2nd speed Rack travel in mm : 6.1...6.5 Del.quantity cm3/ : 2.0...2.6

100 s: (1.6...3.0)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

: 0.60...1.10 travel mm 2nd speed

**Lbw** : 350

: 2.10...2.50 travei mm 3rd speed : 600 rpm

: 3.80...4.40 travel mm

: 950 4th speed rpm

: 7.20...7.40 travel mm : 1200

5th speed rpm : 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Speed rpm : 1020 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550 Aneroid pressure h: 900

: 228.0...231.0 1000 : (224.5...234.5) Del.quantity

Spread : 8.00 cm3

1000 : (12.00)

#### RATED SPEED

1st version Control Lever

position degrees: 109...117

Testing:

1st rack travel in: 10.40 rpm : 995...1005 Speed

2nd rack travel in: 4.00

rpm : 1080...1110 Speed

4th rack travel in: 1200

rpm : 0.00.. 1.00 Speed

LOW IDLE 1 Control lever

position degrees: 63...71

Testina:

: 200 Speed rpm Minimum rack trave: 7.70 : 300 Speed rom

Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

rpm : 380...480 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed mqn hPa : 900 Pressure

Rack travel mm : 11.40...11.50

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.70

2nd pressure hPa : 440

Rack travel in m: 11.10...11.20

3rd pressure hPa : 400

Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 950 Del.quantity cm3/ : 208.0...215.0 1000 s: (204.5...218.5)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 168.0...171.0 1000 s: (164.5...174.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 995...1005

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 210.0...240.0

1000 s: (206.0...244.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : MB 14,7 a37 : 18.09.91 Edition

Replaces

Test oil : TSO-4113

Combination no. : 0 402 648 882

Injection pump

Pump designation: PE8P12OA320LS7801 EP type number : 0 412 628 806

Governor

Governor design. : RQV300...950PA797-35

: 0 421 8 3 974 Governer no.

Customer-spec, information

Customer : MERCEDES-BENZ

Engine : 0M442 A

1st version kW : 269.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rom : 500

Rack travel in mm : 14.00...14.20

Del.guantity cm3/: 20.3...20.5

100 s: (20.0...20.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 6.0...6.4

Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300 : 1.10...1.50 travel mm

rpm : 600 2nd speed

: 4.80...5.30 travel mm

3rd speed rpm : 950

: 7.60...8.10 travel ma

: 1050 4th speed **COU** 

: 9.00...9.50 travel mm

: 1100 5th speed rpm

: 9.90...10.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 990

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 500 Aneroid pressure h: 1150 : 203.0...205.0 Del.quantity 1000 : (200.0...208.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 117...125 Testing: 1st rack travel in: 11.90 rpm : 990...1000 Speed 2nd rack travel in: 4.00 Speed rpm: 1060...1090 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 84...92 Testing: : 200 Speed rom Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 6.00...6.40 CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL Dimension a mm : 0.30 rpm : 950 2nd speed Rack travel in m: 12.90...13.10 3rd speed rpm : 500 Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Settina Speed : 600 rpm Pressure hPa : -Rack travel mm : 10.60...11.00 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 11.00...11.20 2nd pressure hPa : 500

Rack travel in m: 12.60...12.80

START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1150 : 950 Speed rpm Del.quantity cm3/: 189.0...192.0 1000 s: (186.0...195.0) Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 990...1000 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 175.0...190.0 1000 s: (171.0...194.0) Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: SCA 14,0 h5 Test sheet : 20.09.91 Edition : 23.1.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 883

Injection pump

Pump designation : PE8P120A920/4LS7125

: 0 412 628 833 EP type number

Governor

Governor design. : RQV200...900PA795-11

Customer-spec. information Customer : SCANIA

: DS 14 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00 Firing order : 1-2-7-3-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 300 2nd speed

Rack travel in mm: 4.5...5.1

Del.quantity cm3/: 1.5...1.9 100 s: (-)

cm3 : 0.3Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.40...1.80 travel mm rpm : 350 2nd speed

: 1.90...2.50 travel mm

rpm : 650 3rd speed : 4.80...5.20 travel mm

rpm : 945 4th speed

: 7.80...8.00 travel mm

: 1040 5th speed rpm

: 9.10...9.50 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 900

Del.quantity : 214.0...219.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 43...51

Testing:

1st rack travel in: 12.50 rpm : 940...950 Speed

2nd rack travel in: 4.00

Speed rpm : 1025...1055 4th rack travel in: 1150

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed : 100 rpm Minimum rack trave: 11.00 : 300 rpm

Rack travel in mm : 4.50...5.10

Rack travel in mm: 2.00

rom : 320...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 13.50...13.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : Rack travel in m: 11.30...11.40
2nd pressure hPa : 365
Rack travel in m: 12.80...12.90
3rd pressure hPa : 215

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 900 Del.quantity cm3/: 204.0...212.0 1000 s: (202.0...214.0)

Ameroid pressure h: -

: 500 Speed rpm -

Del.quantity cm3/: 158.0...162.0 1000 s: (156.0...164.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.50 Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.50...5.10 Del.quantity cm3/ : 15.0...19.0 1000 s: (-)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

L02

Note remarks

Test sheet : MB 14,7 a38 : 18.09.91 Edition

Replaces

Test oil : ISO-4113

: 0 402 648 890 Combination no.

Injection pump

Pump designation : PE8P120A320LS7801

: 0 412 628 806 EP type number

Governor

Governor design. : RQ300/950PA932-5

: 0 421 801 621 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 A Engine

: 269.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test Lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 500 1st speed

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.3...20.5

100 s: (20.0...20.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 6.0...6.4

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 1150

Del.quantity : 203.0...208.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.90 Speed rpm : 990...1000 2nd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1200 rom : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.2 Testing: rpm : 200 Speed Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 6.00...6.40 Rack travel in mm : 2.00 : 380...420 Speed rpm TORQUE CONTROL : 0.75 Dimension a mm 2nd speed rpm : 950 Rack travel in m: 12.90...13.10 3rd speed rpm : 800 Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Setting rpm : 600 Speed hPa : -Pressure : 10.60...11.00 Rack travel mm Measurement Speed  $1/\min : 600$ 1st pressure hPa : 350 Rack travel in m: 10.00...11.20 2nd pressure hPa : 500 Rack travel in m: 12.60...12.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1150 : 950 Speed **Lbu** Del.quantity cm3/: 189.0...192.0 1000 s: (186.0...195.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500

Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00 Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90 rpm : 990...1000 Speed

Remarks:

L04

Speed

Note remarks

: MB 12,8 o Test sheet : 27.09.91 Edition : 30.8.91 Replaces : ISO-4113 Test oil

: 0 402 648 893 Combination no.

Injection pump

Pump designation : PE8P12OA32OLS7835 : 0 412 628 847 EP type number

Governor

Governor design. : RQ300/950PA971-2 : 0 421 801 548 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M402 A Engine

: 280.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 22.5...22.7

100 s: (22.2...23.0)

cm3 : 0.6 Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1000

: 225.0...227.0 1000 : (222.0...230.0) Del.quantity

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.90 грт : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1150 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 6.2 Testing: : 200 Speed rpm Minimum rack trave: 7.50 : 300 rpm Rack travel in mm : 5.90...6.50 Rack travel in mm : 2.00 : 380...420 Speed rpm TORQUE CONTROL Dimension a mm : 0.50 nd speed rpm : 950 Rack travel in m: 13.90...14.10 2nd speed CDIII : 800 3rd speed Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Setting rpm : 600 hPa : 1000 Speed Pressure : 14.10...14.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 650 Rack travel in m: 12.80...13.00 3rd pressure hPa : 1200 Rack travel in m: 14.20...14.40 \* 4th pressure hPa : -Rack travel in m: 9.20...9.50 FUEL DELIVERY CHARACTERISTICS

cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 : 800 Speed rpm Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 34.0...40.0
1000 s: (30.0...44.0)
Rack travel in mm : 9.20...9.50

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

1st version

Aneroid pressure h: 1500

**UDU** 

: 950

Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0)

Note remarks

: MB 12,8 o 1 : 27.09.91 Test sheet Edition : 26.4.91 Replaces : ISO-4113 Test oil

: 0 402 648 894 Combination no.

Injection pump

Pump designation: PE8P120A320LS7835 EP type number : C 412 628 847

Governor

Governor design. : RQV300...950PA797-18

: 0 421 813 886 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M402 A Engine

: 280.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 22.5...22.7

100 s: (22.2...23.0)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 1.00...1.50 travel mm

2nd speed : 567 rpm

: 4.40...4.90 travel mm

: 780 3rd speed rpm

: 6.10...6.60 travel mm

: 1009 4th speed rpm

: 8.30...8.80 travel mm

: 1092 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 980 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 1000 225.0...227.0 1000 : (222.0...230.0) cm3 : 6.00 1000 : (9.00) Del.quantity Spread RATED SPEED 1st version Control lever position degrees: 122...130 Testing: 1st rack travel in: 12.90 Speed rpm : 990...1000 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1250 rpm : 0.00...1.50 Speed LOW IDLE 1 Control lever position degrees: 80...88 Testing: Speed rpm : 200 Minimum rack trave: 7.50 rpm : 300 Rack travel in mm : 5.90...6.50 CONSTANT REGULATION rpm : 250...360 Speed TORQUE CONTROL Dimension a mm : 0.50 2nd speed rpm : 950 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Satting : 600 Speed man hPa : 1000 Pressure : 14.10...14.30 Rack travel mm Measurement 1/min: 600 Speed ist pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 650

Rack travel in m: 12.80...13.00

3rd pressure hPa : 1200 Rack travel in m: 14.20...14.40 \* 4th pressure hPa : -Rack travel in m: 9.20...9.50 START CUT-OUT Speed 1/min: 240 (260) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 : 950 Speed rpm Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00 1000 s: (12.0) Spread BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.90 speed rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0) Remarks: \* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 14,7 w 2 Test sheet : 18.09.91 Edition : 28.3.91 Replaces : TSO-4113 Test oil

Combination no. : 0 402 648 898

Injection pump

Pump designation : PE8P120A320LS7838 : 0 412 628 848 EP type number

Governor

: RQ300/950PA971-4 Governor design. : 0 421 801 558 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 A Engine

: 320.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

1st speed rom: 600

Rack travel in mm : 13.80...14.00

Del.quantity cm3/: 22.3...22.5

100 s: (22.0...22.8)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 900

: 223.0...225.0 Del.quantity 1000 : (220.0...228.0)

: 6.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testina: 1st rack travel in: 13.50 Speed rpm : 990...1005 2nd rack travel in: 4.00 : 1070...1100 Speed nom 4th rack travel in: 1150 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.5 Testina: Speed rpm : 200 Minimum rack trave: 7.80 Speed rpm : 300 Rack travel in mm : 6.20...6.80 Rack travel in mm : 2.00 : 380...429 Speed rom TORQUE CONTROL Dimension a mm : 950 2nd speed rom Rack travel in m: 14.50...14.70 3rd speed rpm : 800 Rack travel in m: 15.10...15.30 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed MON hPa : 900 Pressure : 13.80...14.00 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.10...10.30 2nd pressure hPa : 650 Rack travel in m: 12.80...13.00 3rd pressure hPa : 1100 Rack travel in m: 13.90...14.10 \* 4th pressure hPa : 1350 Rack travel in m: 14.70...15.00 5th pressure hPa : -Rack travel in m: 9.30...9.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600

: 950

rpm

Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0) : 8.00 Spread cm3 1000 s: (12.0) Aneroid pressure h: 1600 : 800 rpm Speed Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0) : 8.00 cm3 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 138.0...140.0 1000 s: (135.0...143.0) cm3 : 8.00Spread 1000 s: (12.0)

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.50 Speed rpm : 990...1005

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

L10

Speed

Note remarks

: MB 14,7 u 3 : 18.09.91 Test sheet Edition : 3.5.91 Replaces

: ISO-4113 Test oil

: 0 402 648 910 Combination no.

Injection pump

Pump designation : PE8P12OA32OLS7840 EP type number : 0 412 628 850

Governor

Governor design. : RQV300...950PA797-26

: 0 421 813 915 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 A Engine

: 250.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm : (5.15...5.35)

Rack travel in mm: 20.00...21.00 Firing order: 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315 : 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.50...13.70

Del.quantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 6.2...6.8

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

1.00...1.50 travel mm

rpm : 617 2nd speed travel mm

: 5.00...5.50 : 780

3rd speed rpm

: 6.10...6.60 travel mm : 1009

4th speed rpm

: 8.30...8.80 travel mm

rpm : 1092 5th speed

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 900 : 206.0...208.0 Del.quantity 1000 : (203.0...211.0) : 6.00 Spread cm31000 : (9.00) START CUT-OUT Speed RATED SPEED 1st version Control lever position degrees: 118...126 1st version Testing: 1st rack travel in: 12.40 Speed rpm rpm : 990...1000 Speed 2nd rack travel in: 4.00 : 1070...1100 Speed Spread rom 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed rpm Minimum rack trave: 7.60 : 300 man Rack travel in mm : 6.20...6.80 Spread CONSTANT REGULATION : 300...450 Speed rom **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm : 0.60 : 950 2nd speed nom Rack travel in m: 13.40...13.60 3rd speed rpm : 800 Rack travel in m: 14.00...14.20 Speed rom Aneroid/Altitude Compensator Test Speed rpm 1st version Setting Speed rpm : 600 Remarks: Pressure hPa : 900 : 13.50...13.70 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : 350 Rack travel in m: 11.30...11.50 2nd pressure hPa : 650 Rack travel in m: 12.80...13.00

3rd pressure hPa : 1050 Rack travel in m: 13.60...13.70 \* 4th pressure hPa : 1250 Rack travel in m: 13.90...14.10 5th pressure hPa : -Rack travel in m: 10.60...10.80 1/min : 240 (260) FUEL DELIVERY CHARACTERISTICS Aneroid pressure h: 1500 : 950 Del.quantity cm3/: 204.0...207.0 1000 s: (201.0...210.0) cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800
Del.quantity cm3/ : 220.0...224.0
1000 s: (217.0...227.0)
Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/ : 123.0...125.0
1000 s: (120.0...128.0) cm3 : 8.00 1000 s: (12.0) 1mm rack travel less than full load rack tr: 12.40 : 990...1000 STARTING FUEL DELIVERY Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) \* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 12,8 o 4 : 08.10.91 Edition : 26.4.91 Replaces : ISO-4113 Test oil

: 0 402 648 915 Combination no.

Injection pump

Pump designation : PE8P12OA32OLS7835 EP type number : 0 412 628 847

Governor

Governor design. : RQ300/1050PA993-1

: 0 421 801 582 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M402 A Engine

: 280.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test Lines

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm : (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasina

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.80...15.00

Del.quantity cm3/: 22.5...22.7

100 s: (22.2...23.0)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 6.2...6.8
Del.quantity cm3/: 1.6...2.2
100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

Aneroid pressure h: 1000 Del.quantity : 225.0...227.0 1000 : (222.0...230.0)

cm3 : 6.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

: 600 Speed rom

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.70 Speed rpm: 1090...1105 2nd rack travel in: 4.00 Speed rpm: 1170...1200 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rom Rack travel in mm: 6.5 Testing: Speed : 200 rpm Minimum rack trave: 7.80 Speed rpm : 300 Rack travel in mm : 6.20...6.80 Rack travel in mm: 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.50 : 1050 2nd speed rpm Rack travel in m: 14.70...14.90 3rd speed rpm : 800 Rack travel in m: 15.20...15.40 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 1000 Rack travel mm : 14.80...15.00 Measurement  $1/\min: 600$ Speed 1st pressure hPa : 250 Rack travel in m: 10.00...10.20 2nd pressure hPa : 650 Rack travel in m: 13.60...13.80 3rd pressure hPa : 1200 Rack travel in m: 14.90...15.00 \* 4th pressure hPa : -Rack travel in m: 9.60...9.90 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version

L14

Aneroid pressure h: 1500 : 1050 Speed rpm Del.quantity cm3/: 214.0...217.0 1000 s: (211.0...220.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 232.0...236.0 1000 s: (229.0...239.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 13.70

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

#### Note remarks

: MAN 14,5 e2 Test sheet : 28.06.91 Edition Replaces

Test oil : ISO-4113

: 0 402 648 916A Combination no.

Injection pump

Pump designation: PE8P120A520LS7818-1

EP type number : 0 412 628 857

Governor

Governor design. : RQV250...1150PA902

: 0 421 813 720 Governer no.

: 2-7944 Cust. part no.

Customer-spec. information Customer : MAN

: D2848LXE 40 Engine

: 500.0 1st version kW : 2300 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test Lines

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke mm

: (4.45...4.65)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

: 8 Time to cyl. no.

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 25.9...26.1

100 s: (25.6...26.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 500 2nd speed

Rack travel in mm: 8.9...9.1 Del.quantity cm3/: 14.9...15.1

100 s: (14.6...15.4)

cm3 : -Spread 100 s: (-)

3rd speed rpm : 250 Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 5.2...6.0 \*

100 s: (-)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.40...1.60 travel mm

rpm : 450 2nd speed : 3.40...4.00 travel mm

rpm : 850 3rd speed

: 6.30...6.90 travel mm rpm : 1150 4th speed

: 9.40...9.60 travel mm

5th speed : 1450 rpm

: 13.00...14.00 travel nm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1210 Speed

1/min : 200 (220) Rack travel in mm : 15.20...17.80 Speed FUEL DELIVERY CHARACTERISTICS FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1050 1st version Speed Aneroid pressure h: -Aneroid pressure h: 1300 rpm\_ : 500 : 259.0...261.0 Speed Del.quantity Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0) 1000 : (256.0...264.0) : 5.00 Spread cm3 1000 : (9.00)**BREAKAWAY** RATED SPEED 1st version 1st version 1mm rack travel less than Control lever position degrees: 118...126 full load rack tr: 11.80 rpm : 1090...1100 Speed Testina: 1st rack travel in: 11.80 rpm : 1090...1100 STARTING FUEL DELIVERY Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed Speed rpm : 100 Del.quantity cm3/ : 100...120 \* 4th rack travel in: 1450 rpm : 0.00...1.00 Speed 1000 s: (~) LOW IDLE 1 rpm : 100 Control lever Speed Del.quantity cm3/: 0 \*\* position degrees: 80...88 1000 s: (-) Testing: HIGH IDLE rpm : 100 Speed Minimum rack trave: 8.90 Speed rpm: 250
Rack travel in mm: 7.30...7.50
Rack travel in mm: 2.00 1st version rpm : 500 Speed Rack travel in mm: < 7.00 Del.quantity cm3/ : 0 \*\* 1000 s: (-) rpm : 430...490 Speed Aneroid/Altitude 2nd version Compensator Test rpm : 500 Speed Rack travel in mm : < 7.50 Del.quantity cm3/ : < 50 \*\* 1000 s: (-) 1st version Setting : 500 Speed man hPa : 1300 3rd version Pressure : 13.80...13.90 Speed rpm : 500 Rack travel mm Rack travel in mm : 8.30...8.50 Del.quantity cm3/ : 125... \*\* 1000 s: (-) Measurement  $1/\min : 500$ Speed LOW IDLE 1st pressure hPa : -Rack travel in m: 8.90...9.10 Speed rpm : 250
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 52.0...60.0 \*
1000 s: (-) 2nd pressure hPa : 100 Rack travel in m: 9.30...9.40 3rd pressure hPa : 470 Rack travel in m: 12.30...12.60 Remarks: START CUT-OUT

\* applies to cylinders 2, 3, 4 and 8 \*\* applies for cylinders 1, 5, 6, and 7

APPLICATION

Ship

## Note remarks

: MB 14,7 x : 08.10.91 Test sheet Edition : 21.8.91 Replaces Test oil : ISO-4113

: 0 402 648 919 Combination no.

Injection pump

Pump designation : PE8P120A320LS7843 : 0 412 628 859 EP type number

Governor

Governor design. : RQV350...1050PA842-8

: 0 421 813 952 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 LA Engine

: 320.0 1st version kW : 2100 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-4- 1 Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.50...14.70

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm : 5.7...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

## (B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 0.80...1.20 travel mm

rpm : 510 2nd speed

: 3.60...4.10 travel mm

rpm : 1100 3rd speed

: 7.80...8.40 travel mm

rpm : 1270 4th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1125

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1000 : 229.0...231.0 Del.quantity 1000 : (226.0...234.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 13.50 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 63...71 Testing: rpm : 100 Speed Minimum rack trave: 7.40 rpm Rack travel in mm : 5.50...6.10 CONSTANT REGULATION rpm : 350...550 Speed TORQUE CONTROL Dimension a mm : 0.40 2nd speed rpm : 1050 Rack travel in m: 14.50...14.70 3rd speed rpm : 800 Rack travel in m: 14.80...15.00 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 14.50...14.70 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 400 Rack travel in m: 10.90...11.10 2nd pressure hPa : 550 Rack travel in m: 12.20...12.40 3rd pressure hPa : 1250

Rack travel in m: 14.60...14.80 \*

4th pressure hPa : -Rack travel in m: 9.20...9.50 START CUT-OUT 1/min : 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 rpm : 1030 Speed Del.quantity cm3/: 229.0...232.0 1000 s: (226.0...235.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 236.0...240.0 1000 s: (233.0...243.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.50 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 250.0...270.0 1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 14,7 v 5 Test sheet : 30.08.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 648 921 Combination no.

Injection pump

: PE8P120A320L37839 Pump designation

: 0 412 628 849 EP type number

Governor

: RQ300/950PA993-8 Governor design.

: 0 421 801 618 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 LA Engine

: 370.0 1st version kW

: 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 : (4.95...5.15) Prestroke mm

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 15.00...15.10

Del.guantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 6.0...6.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

Aneroid pressure h: 1050

Del.quantity : 250.0...261.0)

: 6.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 15.30 rpm : 990...1005 Speed 2nd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1150 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring : 300 Speed rom Rack travel in mm: 6.3 Testing: Speed rpm Minimum rack trave: 7.60 rpm : 300 Speed Rack travel in mm : 6.00...6.60 Rack travel in mm: 2.00 : 370...410 Speed rom Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 1050 Pressure : 15.10...15.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.20...10.40 2nd pressure hPa : 800 Rack travel in m: 13.90...14.10 3rd pressure hPa : 1300 Rack travel in m: 15.30...15.50 4th pressure hPa : 1600 Rack travel in m: 15.90...16.10 5th pressure hPa : Rack travel in m: 9.30...9.60 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1900 : 950 Speed rom Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0)

cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1900 : 800 Speed rpm Del.quantity cm3/: 283.0...287.0 1000 s: (280.0...290.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00 Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 15.30 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0)

Remarks:

Note remarks

: MB 18,3 L 3 : 27.09.91 Test sheet Edition : 21.8.91 Replaces : ISO-4113 Test oil

: 0 402 649 810 Combination no.

Injection pump

Pump designation : PE10P120A320LS7809

: 0 412 629 800 EP type number

Governor

Governor design. : RQV350...1050PA870-6

: 0 421 813 766 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M443 LA Engine

: 401.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 130...150

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test Lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 : (3.95...4.15) Prestroke mm

Rack travel in mm : 20.00...21.00

: 10- 9- 4- 1- - 6- 3- 5-Firing order

: 0-45-72-117-144-189-Phasing

216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.30...14.50

Del.guantity cm3/: 21.1...21.3

100 s: (20.8...21.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm: 6.2...6.8

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.90...2.10 travel mm

: 700 2nd speed mgn

travel mm : 4.10...4.50

3rd speed : 1100 rpm

travel mm : 7.60...8.00

4th speed : 1200 rpm

travel mm : 9.50...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1100 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 800 : 211.0...213.0 Del.quantity 1000 : (208.0...216.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 114...122 Testing: 1st rack travel in: 13.70 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 64...72 Testing: rpm : 200 Speed Minimum rack trave: 8.60 rpm : 350 Speed Rack travel in mm : 6.20...6.80 CONSTANT REGULATION rpm : 300...400 Speed TORQUE CONTROL Dimension a mm : 0.40 2nd speed rpm : 1050 Rack travel in m: 14.70...14.90 3rd speed rpm : 850 Rack travel in m: 15.10...15.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 hPa : 800 Pressure : 14.30...14.50 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 400 Rack travel in m: 11.70...11.90 2nd pressure hPa : 550
Rack travel in m: 13.20...13.40
3rd pressure hPa : 960
Rack travel in m: 14.40...14.50 \* 4th pressure hPa : 1100 Rack travel in m: 14.80...15.00 5th pressure hPa : -Rack travel in m: 11.10...11.40 START CUT-OUT 1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1300 Speed rpm : 1050 Del.quantity cm3/: 224.0...226.0 1000 s: (221.0...229.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: 1300 Speed rpm : 850 Del.quantity cm3/ : 232.0...236.0 1000 s: (229.0...239.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1300 : 1050 Speed rpm Del.quantity cm3/: 168.0...170.0 1000 s: (165.0...173.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 132.0...136.0 1000 s: (129.0...139.0) cm3 : 8.00Spread 1000 s: (-) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0)

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Remarks:

Note remarks

: MB 21,9 y 1 : 18.09.91 Test sheet Edition : 13.12.89 Replaces : ISO-4113 Test oil

: 0 402 670 802 Combination no.

Injection pump

Pump designation : PE12P12OA320LS7807 EP type number : 0 412 620 806

Governor

Governor design. : RSV350...750POA825-2

: 0 421 833 250 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 A Engine

: 360.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 9.00...12.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-Phasing 180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 21.5...21.7

100 s: (21.2...22.0)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.4...5.9 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...1.40

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 215.0...217.0 Del.quantity

: (212.0...220.0) : 5.00 1000

cm3Spread

: (9.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 23...31

Testing:

1st rack travel in: 13.40
Speed rpm: 750...755
2nd rack travel in: 4.00
Speed rpm: 780...790
4th rack travel in: 1000
Speed rpm: 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 9...17

Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 6.3

Testing:

Speed rpm : 100 Minimum rack trave: 13.00 Speed rpm: 350

Rack travel in mm : 6.20...6.50

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/: 212.0...218.0
1000 s: (209.0...221.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.40 Speed rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 220.0...240.0
 1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 350 Rack travel in mm : 5.40...5.90 Del.quantity cm3/ : 14.0...20.0 1000 s: (11.0...23.0)

Spread

cm3 : 8.00

1000 s: (12.00)

Remarks:

Observe VDT-I-420/120

**APPLICATION** 

Generator

L26

Note remarks

: MAN 10,0 c1 Test sheet : 02.10.91 Edition : 1.2.91 Replaces : ISO-4113 Test oil

: 0 402 735 801 Combination no.

Injection pump

Pump designation : PES5P120A720/3LS7210

EP type number : 0 412 725 808

Governor

Governor design. : RQV325...1000PA960K

: 0 421 815 247 Governer no.

Customer-spec. information Customer : MAN

: D2865LF03 Engine

: 235.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 Prestroke mm : (4.75...4.95) Rack travel in mm : 15.00...16.00 Firing order : 1-3-5-4-

Firing order

: 0-72-144-216-288 Phasing

Tolerance + - 3 : 0.50 (0.75)

Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 24.4...24.6

100 s: (24.1...24.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm : 6.0...6.4 Del.quantity cm3/: 4.7...5.3 100 s: (4.4...5.6)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed : 6 -0...9.60 travel mm

365 1.30...1.50 2nd speed rpm travel mm

: 500 3rd *≟*ed LÜÜ travel im

: 3.20...3.89 : 900 4th spead mon : 7.60...8.00 trave! mm

: 1350 5th spaed RET

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rps: 1110 Speed

Rack travel in mm : 15.20...17.80

1st pressure hPa : -FULL LOAD DELIV. AT FULL LOAD STOP Rack travel in m: 9.20...9.40 2nd pressure hPa : 170 1st version Rack travel in m: 9.60...9.70 rpm : 1000Speed 3rd pressure hPa : 600 Rack travel in m: 12.10...12.30 Aneroid pressure h: 1200 Del.quantity : 244.0...246.0 1000 : (241.0...249.0) : 5.00 cm3 START CUT-OUT Spread 1000 : (9.00) 1/min: 245 (265) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever 1st version position degrees: 293...301 Aneroid pressure h: 1200 , : 900 rpm Testing: Del.quantity cm3/: 261.0...265.0 1st rack travel in: 11.90 1000 s: (258.0...268.0) rpm : 1040...1050 Speed 2nd rack travel in: 4.00 Aneroid pressure h: 1200 Speed rpm : 650 Del.quantity cm3/ : 264.0...270.0 1000 s: (261.0...273.0) Speed rpm : 1135...1165 4th rack travel in: 1350 rom : 0.00...1.00Speed Aneroid pressure h: rpm : 500 Speed LOW IDLE 1 Del quantity cm3/: 159.0...161.0 1000 s: (156.0...164.0) Control lever position degrees: 249...257 Testing: **BREAKAWAY** rpm : 100 Speed Minimum rack trave: 7.70 1st version LIDUI. 1mm rack travel less than Rack travel in mm : 6.10...6.30 full load rack tr: 11.90 CONSTANT REGULATION rpm : 1040...1050 rpm : 340...450 Speed Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1000
Rack travel in m: 12.90...13.00
2nd speed rpm : 900 : 100 Speed rpm Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) Rack travel in m: 13.30...13.50 LOW IDLE 3rd speed rpm : 650 Rack travel in m: 12.60...12.80 rpm : 325 Rack travel in mm : 6.00...6.40 Aneroid/Altitude Del.quantity cm3/: 47.0...53.0 1000 s: (44.0...56.0) Compensator Test cm3 : 8.00 Spread 1000 s: (12.00) 1st version Setting : 900 Remarks: Speed CDM : MAN-NR. 3-7049 hPa : 1200 Pressure · 13.30...13.50 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 Measurement 1/min: 900 start of delivery Speed

Note remarks

: CUM 8,3 t 1 Test sheet : 08.10.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 805AA

Injection pump

Pump designation : PES6P120A120RS7206

: 0 412 726 835 EP type number

Governor

: RQV350...1100PA924 Governor design.

-5K

: 0 421 815 250 Governer no.

: 3281593 Cust. part no.

Customer spec. information : CUMMINS Customer

: 6CTAA Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test Lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 3.50...3.60 Prestroke mm ; (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 17.3...17.5

100 s: (17.0...17.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 3.3...3.9

100 s: (3.1...4.1) cm3 : 0.7Spread

100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.10...1.50 travel mm

rpm : 550 2nd speed

: 3.40...4.00 travel mm

3rd speed : 900 rom

: 6.10...6.70 travel mm : 1150 4th speed rpm

: 8.40...8.60 travel mm

: 1250 5th speed rpm

: 9.40...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1420 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200

: 173.0...175.0 Del.quantity 1000 : (170.0...178.0) cm3 : 5.00 1000 : (9.00) : 5.00 Spread RATED SPEED 1st version Control Lever position degrees: 111...119 Testing: 1st rack travel in: 12.00 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1270...1300 Speed 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW TOLE 1 Control lever position degrees: 73...81 Testing: Speed rom Minimum rack trave: 7.20 : 350 rom Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 350...550 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 13.00...13.10 2nd speed rpm : 600 Rack travel in m: 12.10...12.30 3rd speed rpm : 800 Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 1100 Speed rom hPa : 1200 Pressure : 13.00...13.10 Rack travel mm Measurement 1/min: 1100 Speed

START CUT-OUT 1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 600 Del.quantity cm3/ : 188.5...194.5 1000 s: (185.5...197.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rom Del.quantity cm3/: 137.0...141.0 1000 s: (135.0...143.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.00 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 235.0...255.0 1000 s: (231.0...259.0) LOW IDLE Speed rpm : 350 Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 33.0...39.0 1000 s: (31.0...41.0) cm3 : 7.00Spread 1000 s: (11.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery Start-of delivery mark/lock = 7.5° angular displacement of the cam after start of delivery of cylinder 1.

Rack travel in m: 9.70...10.00

1st pressure hPa : -

2nd pressure hPa : 600

3rd pressure hPa : 425

Rack travel in m: 9.30...9.50

Rack travel in m: 11.10...11.30

Note Pemarks

: CUM 5,9 W Test sheet : 18.09.91 Edition : 21.8.91 Replaces : ISO-4113 Test oil

: 0 402 736 806 Combination no.

Injection pump

Pump designation : PES6P110A120RS7213

: 0 412 716 804 EP type number

Governor

Governor design. : RQV400...1250PA964K

: 0 421 815 252 Governer no.

Customer-spec. information : C.D.C. Customer

: 6BTA-A Engine

: 171.5 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 : (4.30...4.50) Prestroke mm

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 15.80...15.90

Del.quantity cm3/: 16.8...17.0

100 s: (16.5...17.3)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 400.02nd speed Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0) cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 400 1st speed

: 1.60...1.80 travel mm rpm : 600

2nd speed 2.80...3.30 travel mm

1300 3rd speed man

7.20...7.40 travel mm : 1500 4th speed COM

: 8.90...9.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed Aneroid pressure h: 1500

Aneroid F. Del.quantity 1000 : 168.5...170.5 : (165.5...173.5)

cm3 : 5.00 1000 : (9.00) Spread

### RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 14.80

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

rpm : 1475...1505 Speed

4th rack travel in: 1600

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 13...21

Testina:

Speed rpm Minimum rack trave: 7.20 rpm : 400 Speed

Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1250 Rack travel in m: 15.80...15.90

rpm : 825 2nd speed

Rack travel in m: 14.70...14.90

rpm : 700 3rd speed

Rack travel in m: 14.00...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 1250 hPa : 1500 Pressure

: 15.80...15.90 Rack travel mm

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 375 Rack travel in m: 10.00...10.10

3rd pressure hPa : 935

Rack travel in m: 13.70...14.10

START CUT-OUT

1/min: 300 (310) Speed

MD5

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 825
Del.quantity cm3/ : 178.0...184.0
1000 s: (175.0...187.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 87.0...91.0 1000 s: (85.0...93.0)

### **BREAKAWAY**

1st version

1mm rack travel less than

full load rack tr: 14.80

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 12.40...13.40

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C # 3913440

Start-of-delivery mark 6° cam angle after start of delivery cyl. 1

Note remarks

Test sheet : CUM 5,9 w 1 : 18.09.91 Edition : 21.8.91 Replaces : ISO-4113

Test oil

Injection pump

Combination no.

Pump designation : PES6P110A120RS7213 : 0 412 716 804

EP type number

Governor

Governor design. : RQV400...1250PA964-2

: 0 402 736 810

: 0 421 815 254 Governer no.

Customer-spec. information : C.D.C. Customer

: 6BTA-A Engine

: 141.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 14.80...14.90

Del.quantity cm3/: 15.9...16.1

100 s: (15.6...16.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 400.0 2nd speed Rack travel in mm: 5.4...5.6

Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

: 1.60...1.80 travel mm

: 600 2nd speed mqn

2.80...3.30 travel mm 1300 3rd speed man

travel mm

7.20...7.40

1500 4th speed rpm

: 8.90...9.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

Aneroid pressure h: 1200

: 159.0...161.0 Del.quantity

1000 : (156.0...164.0)

: 5.00 cm3 Spread

1000 : (9.00)

M06

RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 13.80 Speed rpm : 1295...1305

2nd rack travel in: 4.00 Speed rpm: 1460...1490 4th rack travel in: 1600

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

rom : 275 Speed Minimum rack trave: 7.20 rpm : 400 Speed

Rack travel in mm: 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250
Rack travel in m: 14.80...14.90

2nd speed rpm : 800 Rack travel in m: 13.10...13.30

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1250 Speed mch. hPa : 1200 Pressure

: 14.80...14.90 Rack travel mm

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.70
2nd pressure hPa : 415
Rack travel in m: 10.20...10.30

3rd pressure hPa : 740

Rack travel in m: 13.20...13.60

START CUT-OUT

Speed 1/min: 290 (300) FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm

Del.quantity cm3/: 158.0...164.0 1000 s: (155.0...167.0)

cm3 : 8.00

Spread 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 95.5...99.5 1000 s: (93.5...101.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80

rpm : 1295...1305 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 32.0...38.0
1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: c.b.c. # 3919090

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

M07

Note remarks

: CUM 5,9 w 2 Test sheet Edition : 18.09.91 : 21.8.91 Replaces : ISO-4113 Test oil

: 0 402 736 811 Combination no.

Injection pump

Pump designation : PES6P110A120RS7213 : 0 412 716 804

EP type number Governor

Governor design. : RQV400...1250PA964-3

: 0 421 815 255 Governer no.

Customer-spec. information : C.D.C. Customer

: 6BTA-A Engine

: 147.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 14.80...14.90

Del.quantity cm3/: 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 400.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0) cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 400 1st speed

: 1.60...1.80 travel mm

rpm : 600 2nd speed

travel mm : 2.80...3.30 1300

3rd speed rpm :

: 7.20...7.40 travel mm : 1500 4th speed rpm

: 8.90...9.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

Aneroid pressure h: 1200 : 158.5...160.5

Del.quantity 1000 : (155.5...163.5)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 56...64

Testina:

1st rack travel in: 13.80

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

Speed rpm : 1460...1490 4th rack travel in: 1600

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm

Minimum rack trave: 7.20 : 400 Speed nom

Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90

2nd speed rpm : 800

Rack travel in m: 13.20...13.40

Aneroid/Altitude Compensator Test

1st version Setting

: 1250 Speed rpm hPa : 1200

Pressure Rack travel mm : 14.80...14.90

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 410

Rack travel in m: 10.00...10.10

3rd pressure hPa : 755

Rack travel in m: 13.20...13.60

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 800 Speed rpm

Del.quantity cm3/: 156.5...162.5 1000 s: (153.5...165.5)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.80

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 11.90...12.90

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.50...5.70

Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3918321

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 22...24 Note remarks : 4.35...4.45 : (4.30...4.50) : CUM 8,3 r 3 : 18.09.91 Prestroke mm Test sheet Edition Rack travel in mm : 10.50 : 15.11.90 Replaces : 1-5-3-6-2-4 Firing order Test oil : ISO-4113 Combination no. : 0 402 736 812 : 0-60-120-180-240-300 Phasing Injection pump Pump designation : PES6P110A120RS7214 : 0 412 716 805 Tolerance + - ° : 0.50 (0.75) EP type number Governor Governor design. : RQV350...1200PA964-4 Time to cyl. no. : 1 BASIC SETTING : 0 421 815 256 Governer no. rpm: 1200 1st speed Customer-spec. information : C.D.C. Customer Rack travel in mm : 12.60...12.70 : 6CTA-A Engine Del.quantity cm3/: 14.7...14.9 1st version kW : 156.0 100 s: (14.4...15.2) : 2400 Rated speed cm3 : 0.5Spread TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil inlet temp. °C : 38...42 rpm : 350.02nd speed Rack travel in mm : 5.7...5.9 Overflow valve Del.quantity cm3/: 2.7...3.3 : 1 417 413 047 100 s: (2.5...3.5) cm3 : 0.8 Spread Inlet press., bar: 1.50 100 s: (1.2) Overflow (B) Setting of injection pump quantity min. 1/h: 115...125 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly rpm : 350 1st speed : 1.80...2.00 travel mm **Opening** 2nd speed : 450 : 207...210 pressure, bar rpm : 3.10...3.50 : 700 travel mm 3rd speed rom Orifice plate : 5.90...6.30 travel mm : 0,6 diameter mm : 1200 4th speed rpm : 9.00...9.20 travel mm : 1 680 750 008 5th speed : 1400 Test lines rpm : 10.70...11.10 travel mm Outside diameter FULL LOAD DELIV. AT FULL LOAD STOP x Wall thickness : 6.00x2.00x600 x Length mm 1st version Speed rpm : 1200 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Aneroid pressure h: 1200

Del.quantity : 147.5...152.5)

per values \_\_\_\_

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 60...68

Testing:

1st rack travel in: 11.60

Speed rpm: 1245...1255
2nd rack travel in: 4.00
Speed rpm: 1375...1405
4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed rpm : 275 Minimum rack trave: 7.20

Speed rpm: 350 Rack travel in mm: 5.70...5.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

rpm : 1200 1st speed

Rack travel in m: 12.60...12.70

2nd speed rpm : 650

Rack travel in m: 11.20...11.60

3rd speed rpm : 550 Rack travel in m: 11.10...11.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 1200 Speed rom hPa : 1200 Pressure

Rack travel mm : 12.60...12.70

Measurement

1/min: 1200 Speed

1st pressure hPa : -

Rack travel in m: 8.00...8.40

2nd pressure hPa : 225
Rack travel in m: 9.20...9.30
3rd pressure hPa : 515
Rack travel in m: 11.10...11.50

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 650 Speed

Del.quantity cm3/: 151.0...157.0 1000 s: (148.0...160.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 90.0...94.0 1000 s: (88.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: C.D.C. # 3917088

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

Note remarks

: CUM 8,3 r 4 : 18.09.91 Test sheet Edition : 21.8.91 Replaces Test oil : TSO-4113

: 0 402 736 813 Combination no.

Injection pump

Pump designation : PES6P110A120RS7214 : 0 412 716 805 EP type number

Governor

: RQV350...1100PA964-5 Governor design.

: 0 421 815 257 Governer no.

Customer-spec. information : C.D.C. Customer

Engine : 6CTA-A

: 187.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rom: 1100 1st speed

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.6...18.8

100 s: (18.3...19.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm : 5.7...5.9 Del.quantity cm3/: 2.7...3.3 100 s: (2.5...3.5)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm:3501st speed

travel mm 1.80...2.00 rpm : 450 2nd speed

: 3.10...3.50 travel mm

rpm : 600 3rd speed

: 5.10...5.50 travel mm

rpm : 1000 4th speed : 8.10...8.30 travel mm

rpm : 1200 5th speed

: 9.60...10.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200 Del.quantity : 186.5...188.5 1000 : (183.5...191.5)

M12

cm3 : 5.00Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 62...70 Testing: 1st rack travel in: 13.50 Speed rpm : 1145...1155 2nd rack travel in: 4.00 rpm : 1290...1320 Speed 4th rack travel in: 1400 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 11...19 Testing: : 275 Speed rpm Minimum rack trave: 7.20 Speed rpm: 350 Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.50...14.60 2nd speed rpm : 650 Rack travel in m: 13.50...13.70 3rd speed rpm : 500 Rack travel in m: 12.90...13.30 Aneroid/Altitude Compensator Test 1st version Setting : 1100 Speed **LDW** hPa : 1200 Pressure : 14.50...14.60 Rack travel mm Measurement

1/min: 1100 Speed 1st pressure hPa : -Rack travel in m: 8.30...8.70 2nd pressure hPa : 285 Rack travel in m: 9.70...9.80 3rd pressure hPa : 700 Rack travel in m: 12.60...13.00 START CUT-OUT 1/min : 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 650 Speed rpm Del.quantity cm3/: 198.0...204.0 1000 s: (195.0...207.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 98.0...102.0 1000 s: (96.0...104.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.50 rpm : 1145...1155 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.80...11.80 LOW IDLE Speed rpm : 350
Rack travel in mm : 5.70...5.90
Del.quantity cm3/ : 27.0...33.0
1000 s: (25.0...35.0) cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

: C.D.C. # 3916628

Bow dimension: Sliding-sleeve position = 37.0 mm

Note remarks

: CUM 8,3 r 1 : 18.09.91 Test sheet Edition : 21.8.91 Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump

Pump designation : PES6P110A120RS7214

EP type number : 0 412 716 805

Governor

: RQV350...1200PA964-6 Governor design.

: 0 421 815 258 Governer no.

Customer-spec. information : C.D.C. Customer

: 6CTA-A Engine

1st version kW : 187.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45 : (4.30...4.50) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no.

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 2.7...3.3 100 s: (2.5...3.5)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

2nd speed : 450 rpm

: 3.10...3.50 travel mm 3rd speed : 700 rpm

5.90...6.30 travel mm

4th speed 1200 rpm

9.00...9.20 travel mm

1400 5th speed man

10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

Aneroid pressure h: 1200

Del.quantity : 183.0...188.0)

cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control Lever position degrees: 62...70 Testina: 1st rack travel in: 13.50 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 Speed rpm : 1405...1435 4th rack travel in: 1500 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 11...19 Testina: Speed rpm Minimum rack trave: 7.20 : 350 Speed: **MON** Rack travel in mm : 5.40...5.60 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 14.50...14.60 2nd speed rpm : 650 Rack travel in m: 11.60...12.00 Aneroid/Altitude Compensator Test 1st version Setting : 1200 Speed **COM** hPa : 1200 Pressure : 14.50...14.60 Rack travel mm Measurement

1/min: 1200 Speed 1st pressure hPa :-Rack travel in m: 7.70...8.10 2nd pressure hPa : 270 Rack travel in m: 9.50...9.60 3rd pressure hPa : 700 Rack travel in m: 12.60...13.00 START CUT-OUT M15

1/min : 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 650 Del.quantity cm3/: 167.5...173.5 1000 s: (164.5...176.5) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.50 rpm : 1245...1255 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.70...11.70 LOW IDLE Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: : C.D.C # 3917089

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension: Sliding-sleeve position = 37.0 mm

Note remarks

: CUM 8,3 r 2 Test sheet : 18.09.91 Edition : 21.8.91 Replaces

: ISO-4113 Test oil

: 0 402 736 816 Combination no.

Injection pump

Pump designation : PES6P110A120RS7214

EP type number : 0 412 716 805

Governor

Governor design: RQV350...1200PA964-8

: 0 421 815 264 Governer no.

Customer-spec. information : C.D.C. Customer

Engine : 6CTA-A

: 213.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Openina |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

: 1 680 750 008 Test Lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm: 14.70...14.80

Del.quantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm : 5.6...5.8 Del.quantity cm3/: 2.7...3.3

100 s: (2.5...3.5)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

rpm : 450 2nd speed : 3.10...3.50 travel mm

rpm : 700

3rd speed

: 5.90...6.30 travel mm rpm : 1200 4th speed

: 9.00...9.20 travel mm

: 1400 5th speed rpm

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200

Spread cm3 : 5.00

 $1000 \div (9.00)$ 

RATED SPEED

1st version Control Lever

position degrees: 62...70

Testing:

1st rack travel in: 13.20 Speed rpm : 1245...1255

2nd rack travel in: 4.00

rpm : 1400...1430 Speed

4th rack travel in: 1500

rom : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testina:

Speed rpm Minimum rack trave: 7.20 Speed rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

: 1100 1st speed rpm

Rack travel in m: 14.70...14.80

2nd speed rpm : 650

Rack travel in m: 12.60...13.00

3rd speed rpm : 1200

Rack travel in m: 14.20...14.40

Aneroid/Altitude Compensator Test

1st version

Setting

: 1100 Speed rpm hPa : 1200 Pressure

: 14.70...14.80 Rack travel mm

Measurement

1/min: 1100 Speed

1st pressure hPa : -

Rack travel in m: 7.80...8.20

2nd pressure hPa : 295

Rack travel in m: 9.60...9.70

3rd pressure hPa : 745

Rack travel in m: 12.80...13.20

START CUT-OUT

1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 650 Speed rpm

Del.quantity cm3/: 181.0...187.0 1000 s: (178.0...190.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 90.0...94.0

1000 s: (88.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm: 10.70...11.70

LOW IDLE

Speed rpm : 350 Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: c.b.c # 3916626

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Bow dimension:

Sliding-sleeve position = 37.0 mm

Note remarks

: MAC 11,1 a Test sheet : 08.10.91 Edition : 4.9.90 Replaces : ISO-4113 Test oil

: 0 402 746 810 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

: RQV325...900PA848K Governor design.

Governer no. : 0 421 815 168

Customer-spec. information

: MACK TRUCKS Customer

: E6 350 4VH Engine

: 261.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test Lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm: 4.0...4.2 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.20...1.40 travel mm

: 450 2nd speed rpm

: 3.10...3.30 travel mm

3rd speed : 850 rpm

: 5.90...6.10 travel mm

: 1000 4th speed rpm

travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 900 Del.quantity : 236.5...238.5 1000 : (233.5...241.5)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 12.90 rpm : 950...980 2nd rack travel in: 4.00 Speed rpm : 1085...1095 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: speed rpm : 275 Minimum rack trave: 1.50 Speed rpm : 325 Rack travel in mm : 4.00...4.20 CONSTANT REGULATION : 325...520 Speed MON TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 13.90...14.00 Rack travel in m: 13.90...14.00

2nd speed rpm : 625

Rack travel in m: 14.10...14.20

3rd speed rpm : 800

Rack travel in m: 14.00...14.10

4th speed rpm : 500 Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting Speed : 625 rpm Pressure hPa : 900 : 14.10...14.20 Rack travel mm Measurement 1/min: 625 Speed

1st pressure hPa : -Rack travel in m: 8.50...8.90
2nd pressure hPa : 275
Rack travel in m: 10.00...10.10 3rd pressure hPa : 570 Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS M19

1st version Aneroid pressure h: 900 Speed rpm : 625 Del.quantity cm3/ : 257.0...263.0 1000 s: (254.0...266.0) cm3 : 8.00 1000 s: (12.0) Spread Speed rpm : 850 Del.quantity cm3/ : 159.0...161.0 \* 1000 s: (141.5...162.5) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) **BREAKAWAY** 

full load rack tr: 12.90 rpm : 950...980 Speed

1mm rack travel less than

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 8.50...8.90

LOW IDLE

1st version

Speed rpm : 325 Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173P10

Delivery-valve spring pre-tension 3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: PER 12,2 e2 Test sheet Edition : 18.09.91

Replaces

: ISO-4113 Test oil

: 0 402 746 844 Combination no.

Injection pump

Pump designation : PES6P120A320RS7162

EP type number : 0 412 726 819

Governor

Governor design. : RQ750PA836-2 : 0 421 801 628 Governer no.

Customer-spec. information : PERKINS Customer

Engine : 2006 TAG

: 280.0 1st version kW Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke ms : (4.45...4.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-4-2-6-3-5

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.00...13.10

Del.guantity cm3/: 37.9...38.1

100 s: (37.6...38.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 3.8...4.4 100 s: (3.5...4.7)

cm3 : 0.8Spread 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 700 Speed rpm

: 379.0...381.0 Del.quantity 1000 : (376.0...384.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 12.00 rpm : 750...755 Speed 2nd rack travel in: 4.00

rpm : 780...793 Speed

4th rack travel in: 820

rpm : 0.00...1.00Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.00 Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 300.0...340.0 1000 s: (296.0...344.0)

Remarks:

APPLICATION

Generator

Note remarks

: RVI 6,2 h Test sheet : 08.10.91 Edition : 21.6.91 Replaces : ISO-4113 Test oil

: 0 402 746 883 Combination no.

Injection pump

Pump designation : PES6P110A320RS7198

: 0 412 716 802 EP type number

Governor

Governor design. : RQV275...1250PA942K

: 0 421 815 234 Governer no.

Customer-spec. information Customer

Engine : MIDRO6-06-26

: 132.5 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.60...4.70 Prestroke mm

: (4.55...4.75)

Rack travel in mm : 12.50...13.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 14.50...14.60

Del.guantity cm3/: 15.4...15.6

100 s: (15.1...15.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 275.0 2nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/: 1.8...2.3

100 s: (1.5...2.5)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed : 9.70...9.90 travel mm

rpm : 275 2nd speed : 0.90...1.10 travel mm

3rd speed rpm : 600

: 4.20...4.60 travel mm rpm : 1000 4th speed

travel mm : 7.10...7.50

rpm : 1600 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1370

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed Aneroid pressure h: 1000

Del.quantity : 134.0...158.5)

M22

cm3 : 4.00 1000 : (7.50) Spread

RATED SPEED

1st version Control Lever

position degrees: 110...118

Testing:

1st rack travel in: 13.50 Speed rpm : 1315...1325 2nd rack travel in: 4.00

rpm : 1475...1505 Speed

4th rack travel in: 1600

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 58...66

Testina:

Speed rpm Minimum rack trave: 6.00

Speed rpm

Rack travel in mm: 5.10...5.30

CONSTANT REGULATION

rpm : 350...480 Speed

TORQUE CONTROL Dimension a mm : ?

Torque control curve - 1st version

1st speed

st speed rpm : 1250 Rack travel in m: 14.50...14.60

rpm : 750 2nd speed

Rack travel in m: 13.60...13.80

rpm : 300 3rd speed

Rack travel in m: 12.80...13.20

Aneroid/Altitude Compensator Test

1st version

Setting

: 1250 Speed rpm hPa : 1000 Pressure

: 14.50...14.60 Rack travel mm

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 360

Rack travel in m: 12.80...12.90

3rd pressure hPa : 220

Rack travel in m: 11.80...12.20

START CUT-OUT

1/min: 200 (220) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm: 750
Del.quantity cm3/: 119.0...123.0
1000 s: (116.0...126.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 67.0...69.0 1000 s: (64.5...71.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 1315...1325 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.00...5.40
Del.quantity cm3/: 18.0...23.0
1000 s: (15.5...25.5)
Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAC 12,0 h6 Test sheet : 18.09.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 746 887AA

Injection pump

Pump designation : PES6P120A720RS7200

: 0 412 726 833 EP type number

Governor

Governor design. : RQV325...975PA944-2K

: 0 421 815 237 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: E7-275A Engine

: 205.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 11.00...13.00 Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 975 1st speed

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 340.02nd speed Rack travel in mm : 4.8...5.0 Del.quantity cm3/: 3.1...3.7 100 s: (2.9...3.9)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm rpm : 450 2nd speed

: 2.80...3.20 travel mm

3rd speed : 950 rpm

: 7.90...8.10 travel mm

: 1200 4th speed rpm

: 10.20...10.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200 Del.quantity : 230.5...232.5 Del.quantity : 230.3...235.5)

: 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 12.20 Speed rpm : 1015...1045 2nd rack travel in: 4.00 Speed rpm : 1180...1190 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 8...16 Testing: Speed rom : 275 Minimum rack trave: 6.00 : 340 rpm Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 975 Rack travel in m: 13.20...13.30 rpm : 600 2nd speed Rack travel in m: 12.30...12.50 3rd speed rpm : 500 Rack travel in m: 11.50...11.90 Ameroid/Altitude Compensator Test 1st version Setting : 975 Speed rpm hPa : 1200 Pressure : 13.20...13.30 Rack travel mm Measurement 1/min: 975 Speed 1st pressure hPa : -

Rack travel in m: 8.40...8.80 2nd pressure hPa : 350 Rack travel in m: 9.80...9.90

Rack travel in m: 11.90...12.30

3rd pressure hPa : 660

START CUT-OUT 1/min : 250 (255) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 600 rpm Del.quantity cm3/: 244.0...250.0 1000 s: (241.0...253.0) : 8.00 cm3Spread 1000 s: (12.0) : 875 Speed rom Del.quantity cm3/: 199.0...201.0 \* 1000 s: (180.5...207.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.20 rpm : 1015...1045 Speed STARTING FUEL DELIVERY LOW IDLE rpm : 340 Speed Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 31.0...37.0 1000 s: (29.0...39.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery Bow dimension: Sliding-sleeve position = 37.0 mm \* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment,

check value for engine equipment.

Test pressure, bar: 22...24 BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.25...3.35 : (3.20...3.40) Prestroke mm Note remarks 9.00...12.00 : MAC 12,0 m Rack travel in mm : Test sheet : 18.06.91 : 1-5-3-6-2-4 Edition Firing order : 13.5.91 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Combination no. : 0 402 746 911 Phasing Phasing Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PES6P120A720RS7239 : 0 412 726 850 Time to cyl. no. : 1 EP type number Governor : RGV325...900PA944-13 BASIC SETTING Governor design. rpm: 900 : 0 421 815 284 1st speed Governer no. Rack travel in mm : 12.80...12.90 Customer-spec. information : MACK TRUCKS Customer Del.quantity cm3/: 23.1...23.3 : E7-350 ITC argine 100 s: (22.8...23.6) : 261.0 1st version kW cm3 : 0.5: 1800 Spread Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Test oil Rack travel in mm : 5.0...5.2 inlet temp. °C : 38...42 Del.quantity cm3/: 4.6...5.2 100 s: (4.4...5.4) Overflow valve cm3 : 0.8 : 2 417 413 011 Spread 100 s: (1.2) Overflow (B) Setting of injection pump quantity min. 1/h: 160...170 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed : 1.20...1.40 travel mm Opening : 450 2nd speed : 207...210 pressure, bar rpm : 2.50...3.20 travel mm 3rd speed : 650 Orifice plate rpm : 5.60...5.80 diameter mm : 0,6 travel mm : 900 4th speed rpm : 8.30...8.50 travel mm : 1 680 750 008 5th speed : 1100 Test lines : 10.30...10.80 travel mm Outside diameter x Wall thickness FULL LOAD DELIV. AT FULL LOAD STOP : 6.00X2.00X600 x Length mm 1st version rpm : 900 Speed (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Aneroid pressure h: 1200 Aneroid F. Del.quantity 1000 : 231.5...233.5 : (228.5...236.5) per values : 5.00 Spread cm3 1000 : (9.00) BEGINNING OF DELIVERY

M27

RATED SPEED 1st version Control Lever Testing: Speed 2nd rack travel in: 4.00

position degrees: 58...66

1st rack travel in: 11.80 rpm : 940...990

Speed rpm : 1090...1100 4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed rpm : 275 Minimum rack trave: 6.20

Speed rpm : 325 Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 12.80...12.90

2nd speed

nd speed rpm : 625 Rack travel in m: 12.70...13.00 d speed rpm : 550

3rd speed

Rack travel in m: 11.80...12.20

Aneroid/Altitude Compensator Test

1st version Setting

rom : 625 hPa : 1200 Speed man Pressure

: 12.70.../3.00 Rack travel mm

Measurement

1/min: 625 Speed

1st pressure hPa : -

Rack travel in m: 7.40...7.80

2nd pressure hPa : 365

Rack travel in m: 8.90...9.00

3rd pressure hPa : 665

Rack travel in m: 11.30...11.70

START CUT-OUT

1/min : 250 (255) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 625 Speed rpm

Del.quantity cm3/: 266.5...272.5 1000 s: (263.5...275.5)

: 8.00 Spread cm3 1000 s: (12.0)

: 875 Speed rom

Del.quantity cm3/: 199.0...201.0 \* 1000 s: (180.5...207.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 147.5...151.5 1000 s: (145.5...153.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.80 rpm : 940...990 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 210.0...240.0 1000 s: (205.0...245.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 325 Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 46.5...52.5 1000 s: (44.5...54.5)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5203-P8

Bow dimension:

Sliding-sleeve position = 37.0 mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 12.0 m1 : 18.06.91 Test sheet Edition : 13.5.91 Replaces : ISO-4113 Test oil : 0 402 746 912 Combination no. Injection pump Pump designation : PES6P120A720RS7239 : 0 412 726 850 EP type number Governor : RQV325...875PA944-14 Governor design. : 0 421 815 285 Governer no. Customer-spec. information : MACK TRUCKS Customer : EM7-300 ITC Engine 1st version kW : 224.0 : 1750 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Overflow quantity min. 1/h: 160...170 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 : 1 680 750 008 Test lines Outside diameter

x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump secting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_\_ BEGINNING OF DELIVERY

Test pressure, bar: 22...24 : 3.25...3.35 Prestroke mm : (3.20...3.40) Rack travel in mm : 11.00...13.00 Firing order : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. BASIC SETTING 1st speed rpm: 875 Rack travel in mm : 11.20...11.30 Del.quantity cm3/: 21.6...21.8 100 s: (21.3...22.1) cm3 : 0.5Spread 100 s: (0.9) rpm : 325.02nd speed Rack travel in mm: 4.4...4.6 Del.quantity cm3/: 4.6...5.2 100 s: (4.4...5.4) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed : 1.70...1.90 travel mm : 450 2nd speed rpm : 4.20...4.60 travel mm : 650 3rd speed rpm : 8.00...8.40 travel mm : 900 4th speed rpm 10.00...10.20 trave! 📾 5th sr≋ 1000 rpm : 10.80...11.20 travet 病 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 875 Speed Aneroid pressure h: 1200 : 216.5...218.5 1000 : (213.5...221.5)

: 5.00

1000 : (9.00)

cm3

Del.quantity

Spread

RATED SPEED 1st version Control lever position degrees: 63...71 Testing: 1st rack travel in: 10.20 rpm : 915...965 Speed 2nd rack travel in: 4.00 rpm : 1015...1025 Speed 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 9...17 Testina: Speed rpm Minimum rack trave: 6.00 Speed rpm Rack travel in mm : 4.40...4.60 CONSTANT REGULATION : 325...520 Speed rom TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 11.20...11.30 rpm : 510 2nd speed Rack travel in m: 12.90...13.10 3rd speed rpm : 450 Rack travel in m: 11.80...12.40 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 1200 Pressure : 12.90...13.10 Rack travel mm Measurement 1/min : 510Speed 1st pressure hPa : -Rack travel in m: 7.10...7.50 2nd pressure hPa : 370 Rack travel in m: 8.70...8.80 3rd pressure hPa : 730 Rack travel in m: 11.50...11.90

1/min: 250 (255) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 510 Del.quantity cm3/ : 315.5...321.5 1000 s: (312.5...324.5) cm3 : 8.00Spread 1000 s: (12.0) : 875 Speed man Del.quantity cm3/: 199.0...201.0 \* 1000 s: (159.5...183.0) Aneroid pressure h: -: 400 Speed rpm Del.quantity cm3/: 160.0...164.0 1000 s: (158.0...166.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.20 rpm : 915...965 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 210.0...240.0 1000 s: (205.0...245.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm Rack travel in mm : 4.40...4.60 Del.quantity cm3/: 46.0...52.0 1000 s: (44.0...54.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : MACK # 313GC5203-P6 Bow dimension: Sliding-sleeve position = 37.0 mmSetting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery \* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment,

check value for engine equipment.

START CUT-OUT

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : BAO 15,9 d Test sheet : 27.09.91 Edition : 21.8.91 Replaces Test oil : ISO-4113 : 0 402 746 920 Combination no. Injection pump Pump designation : PES6P120A320RS7241 : 0 412 726 854 EP type number Governor Governor design. : RQV350...900PA935-1 : 0 421 813 820 Governer no. Customer-spec. information : BAUDOUIN Customer : 6P15 2E Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 074 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack trayel in mm : 12.00...12.10 Del.quantity cm3/: 33.9...34.1 100 s: (33.6...34.4) Spread cm3 : 0.5100 s: (0.9) rpm : 350.02nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 945 1st speed : 8.40...8.60 travel mm 350 2nd speed rpm : 1.30...1.70 travel mm 3rd speed : 550 rpm : 3.60...4.20 travel mm : 750 4th speed rom : 5.90...6.30 travel mm 5th speed rom : 1200 : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 940 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed : 339.0...341.0 Del.quantity 1000 : (336.0...344.0) : 5.00 Spread cm3 1000 : (9.00)

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 3.60...3.70

: (3.55...3.75)

## RATED SPEED

1st version Control lever

position degrees: 119...127

Testing:

1st rack travel in: 11.00 rpm : 940...950 Speed 2nd rack travel in: 4.00 rpm : 1000...1030 Speed 4th rack travel in: 1150

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 83...91

Testing:

rpm : 100 Speed Minimum rack trave: 6.40 rpm : 350 Speed

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

rpm : 350...450 Speed

START CUT-OUT

1/min : 270 (290) Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00 rpm : 940...950 Speed

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

**N06** 

Note remarks

Test sheet : MB 11,8 v : 27.09.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 746 921 Combination no.

Injection pump

Pump designation : PES6P120A720LS7242

: 0 412 726 856 EP type number

Governor

Governor design. : RQ300/1050PA774-5

: 0 421 801 608 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M447 LA Engine

: 306.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15) Rack travel in mm : 19.00...21.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 15.50...15.70

Del.quantity cm3/: 27.4...27.6

100 s: (27.1...27.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 5.8...6.2 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1000

Del.quantity : 2/4.0...279.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 20.0

Testina: 1st rack travel in: 14.70 Speed rom: 1090...1105 2nd rack travel in: 4.00 Speed rpm: 1150...1180 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring : 300 rom Rack travel in mm: 6.0 : 300 Speed rpm Rack travel in mm : 5.80...6.20 Rack travel in mm : 2.00 : 360...400 Speed rom TORQUE CONTROL Dimension a mm : 1050 2nd speed rpm Rack travel in m: 15.70...15.90 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 15.50...15.70 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.20...11.40 2nd pressure hPa : 700 Rack travel in m: 14.30...14.50 3rd pressure hPa : 1300 Rack travel in m: 15.70...15.90 4th pressure hPa : 1450 Rack travel in m: 16.20...16.40 5th pressure hPa : -Rack travel in m: 10.30...10.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600 : 1050 Speed FOM Del.quantity cm3/: 269.0...272.0 1000 s: (266.0...275.0)

cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1600 : 700 Speed rom Del.quantity cm3/: 297.0...301.0 1000 s: (294.0...304.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 143.0...145.0
1000 s: (140.0...148.0) cm3 : 8.00 Spread 1000 s: (12.0)

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 14.70 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

Note remarks

: MB 11,8 u 3 Test sheet : 27.09.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 746 923

Injection pump

Pump designation : PES6P120A720LS7237

: 0 412 726 851 EP type number

Governor

: RQ300/1100PA1013-2 Governor design.

: 0 421 801 611 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M447 hA Engine

1st version kW : 184.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x10x0 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5,35)

Rack travel in mm : 20.00...21.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 12.00...12.20

Del.quantity cm3/: 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.6...6.2 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 500

Del.quantity : 103.0...168.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm Rack travel in mm: 20.0

Testing: 1st rack travel in: 12.30 Speed rpm: 1145...1160 2nd rack travel in: 4.00 Speed rpm: 1220...1250 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.9 Testing: Speed rpm : 200 Minimum rack trave: 7.80 Speed rpm: 300
Rack travel in mm: 5.60...6.20
Rack travel in mm: 2.00
Speed rpm: 370...410 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 500 Pressure : 12.00...12.20 Rack travel mm Measurement 1/min : 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.60...11.80 2nd pressure hPa : 600 Rack travel in m: 12.20...12.40 3rd pressure hPa : 770 Rack travel in m: 12.80...13.00 4th pressure hPa : -Rack travel in m: 11.40...11.70 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 rpm\_ : 1100 Speed Del.quantity cm3/: 199.0...202.0 1000 s: (196.0...205.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1400 Speed rpm : 800

Del.quantity cm3/: 203.0...207.0 1000 s: (200.0...210.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 139.0...141.0 1000 s: (136.0...144.0) Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.30 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

:

N10

Note remarks

: RVI 6,2 L Test sheet : 08.10.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 746 924 Combination no.

Injection pump

Pump designation: PES6P110A320RS7243

: 0 412 716 806 EP type number

Governor

Governor design. : RQV275...1250PA942-2

: 0 421 815 288 Governer no.

Customer-spec. information : RVI Customer

: MIDRO6-06-26 L/2 Engine

1st version kW : 132.5 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening 1 0 1

: 172...175 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70 : (4.55...4.75)

Rack travel in mm : 12.50...13.50 Firing order : 1-5-3-6-2-4

Firing order

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 13.9...14.1

100 s: (13.9...14.1)

rpm : 275.0 2nd speed

Rack travel in mm : 4.50...4.90 Del.quantity cm3/ : 2.2...2.7 100 s: (2.2...2.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed

: 9.70...9.90 travel mm : 275

2nd speed rpm : 0.90...1.10

travel mm

3rd speed rpm : 600 : 4.20...4.60 travel mm

: 1000 4th speed rom

: 7.00...7.40 travel mm

: 1600 5th speed man

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1470

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 739.0...141.0)

RATED SPEED

1st version Control lever position degrees: 269...277 Testina: 1st rack travel in: 10.10 rpm : 1315...1325 Speed 2nd rack travel in: 4.00 Speed rpm : 1435...1465 4th rack travel in: 1600 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 219...227 Testina: Speed : 200 rpm Minimum rack trave: 5.30 rpm : 275 Speed Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 350...480 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 1250 1st speed rpm Rack travel in m: 11.10...11.20 rpm : 650 2nd speed Rack travel in m: 10.10...10.30 rpm : 300 3rd speed Rack travel in m: 9.40...9.80 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 1250 Pressure hPa : 1000 Rack travel mm : 11.10...11.20 Measurement 1/min: 1250 Speed 1st pressure hPa : -Rack travel in m: 8.40...8.60 2nd pressure hPa : 240 Rack travel in m: 9.20...9.30 3rd pressure hPa : 160 Rack travel in m: 8.60...9.00

START CUT-OUT

Speed

MZ

1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1000 : 650 Speed rpm Del.quantity cm3/: 126.0...130.0 1000 s: (126.0...130.0) : 650 Speed COM Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 79.0...81.0
1000 s: (79.0...81.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 1315...1325 STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 100.0...120.0 1000 s: (96.0...124.0) LOW IDLE Speed rpm : 275 Rack travel in mm : 4.50...4.90 Del.quantity cm3/: 22.0...27.0 1000 s: (22.0...27.0)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: DEE 7,7 n Test sheet Edition : 18.09.91

Replaces

Test oil : ISO-4113

: 0 402 776 808 Combination no.

Injection pump

Pump designation : PES6P120A720RS7223

: 0 412 726 843 EP type number

Governor

Governor design. : RSV400...1050P0A547

: 0 421 833 349 Governer no.

Customer-spec. information

: JOHN DEERE Customer

: 6101 HZ010 Engine

: 241.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 2 417 413 075

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 140...150

Test nozzle holder

: 1 688 901 105 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 3.55...3.65 : (3.50...3.70) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm : 10501st speed

Rack travel in mm: 12.90...13.00

Del.quantity cm3/: 25.9...26.1

100 s: (25.6...26.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 400.0 2nd speed

Rack travel in mm : 6.1...6.3 Del.quantity cm3/ : 2.0...2.6

100 s: (1.8...2.8)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 1200

: 259.5...261.5 Del.quantity

1000 : (256.5...264.5)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 39...47

Testing:

1st rack travel in: 11.90

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

: 1155...1165 Speed rpm

3rd rack travel in: 4.00

rpm : 1155...1185 Speed

4th rack travel in: 1300

rpm : 0.30...1.40Speed

LOW IDLE 1

Control Lever

position degrees: 18...26

Setting point w/out bumper spring

rpm : 400 Speed

Rack travel in mm: 5.2

Testing:

Speed rpm : 100 Minimum rack trave: 19.00

Speed rpm : 400 Rack travel in mm : 5.60...5.80

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.90...13.00

2nd speed rpm : 800

Rack travel in m: 13.30...13.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm

hPa : 1200 Pressure

: 13.30...13.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.80...10.90
2nd pressure hPa : 390
Rack travel in m: 11.60...11.70
3rd pressure hPa : 700

Rack travel in m: 12.60...13.00

FLEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed

rpm : 800

Del.quantity cm3/: 279.0...285.0 1000 s: (276.0...288.0)

Aneroid pressure h: -

rpm : 500 Speed Del.quantity cm3/: 147.5...151.5 1000 s: (145.5...153.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 95.0...135.0

1000 s: (90.0...140.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 6.10...6.30

Del.quantity cm3/: 20.0...26.0 1000 s: (18.0...28.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Adjustment without torque-control E47014 spring retainer with 0,5 mm less

control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

Starting/full-load transition speed

from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam

rotation angle after start of delivery,

cylinder 1

Note remarks

: VOL 7,1 f : 18.09.91 Test sheet Edition : 24.4.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 846 050

Injection pump

Pump designation : PE6P110A320RS8009 : 0 412 816 010 EP type number

Governor

Governor design. : RQV250...1200PA953K

: 0 421 815 996 Governer no.

Customer-spec. information

: VOLVO-TRUCK Customer

: TD73EB Engine

: 184.0 1st version kW : 2400 Rated speed

TEST BENCH REGUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 064

Inlet press., bar: 2.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0.6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length non

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90 : (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 16.4...16.6

100 s: (16.2...16.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 2.1...2.5

100 s: (1.8...2.8) cm3 : 0.7Spread

100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.10...1.50 travel mm

rpm : 400 2nd speed : 3.00...3.60 travel mm

rpm : 850 3rd speed : 6.70...7.30 travel mm

rpm : 1250 4th speed

: 10.30...10.50 travel mm

rpm : 1350 5th speed : 11.40...11.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1240 Speed

Rack travel in mm : 15.20...17,80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 1200 Del.quantity : 164.0...166.0 1000 : (162.0...168.0) cm3 : 5.00 Spread 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 117...125 Testina: 1st rack travel in: 11.30 rpm : 1260...1270 Speed 2nd rack travel in: 4.00 rpm : 1350...1380 Speed 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 69...77 Testina: : 100 Speed rom Minimum rack trave: 6.40 rpm Speed Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 300...450 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 12.30...12.40

2nd speed rpm : 700 Rack travel in m: 12.00...12.20 3rd speed rpm : 850 Rack travel in m: 12.20...12.40 4th speed rpm : 350 Rack travel in m: 10.60...10.90

Aneroid/Altitude Compensator Test

1st version Setting : 1000 Speed rpm hPa : 1200 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min: 1000 Speed

1st pressure hPa : -Rack travel in m: 7.30...7.50 2nd pressure hPa : 90

Rack travel in m: 7.50...7.60 3rd pressure hPa : 830 Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 Speed rpm : 700 Del.quantity cm3/: 195.0...199.0 1000 s: (192.0...202.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm\_ : 700 Speed Del.quantity cm3/: 99.0...101.0 1000 s: (96.0...104.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.30 rpm : 1260...1270 Speed

LOW IDLE

Speed rpm Rack travel in mm : 4.70...4.90

Remarks:

N16

Note remarks

: VOL 7,1 f 1 : 18.09.91 Test sheet Edition : 24.4.91 Replaces : ISO-4113 Test oil

: 0 402 846 051 Combination no.

Injection pump

Pump designation : PE6P110A320RS8009 EP type number : 0 412 816 010

Governor

: RQV250...1200PA953-1 Governor design.

: 0 421 815 995 Governer no.

Customer-spec. information

: VOLVO-TRUCK Customer

Engine : TD73EA

: 158.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 064

Inlet press., bar: 2.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.80...3.90 Prestroke mm

: (3.75...3.95)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.30 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 11.40...11.50

Del.guantity cm3/: 15.2...15.4

100 s: (15.0...15.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 2.1...2.5 100 s: (1.8...2.8)

cm3 : 0.7 Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed : 250 rpm

1.10...1.50 travel mm 400

2nd speed rpm

3.00...3.60 travel mm 850 3rd speed rpm

6.70...7.30 travel mm

1250 4th speed rpm 10.30...10.50

travel mm : 1350

5th speed rpm

: 11.40...11.80 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

: 1240 rpm Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rbm : 1200

M17

Aneroid pressure h: 1200 Del.quantity : 152.0...154.0 Del.quantity 1000 : (150.0...156.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 117...125 Testing: 1st rack travel in: 10.40 rpm : 1260...1270 Speed 2nd rack travel in: 4.00 rpm : 1330...1360 Speed 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 69...77 Testing: : 100 Speed rpm Minimum rack trave: 6.40 : 300 Speed rpm Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 300...450 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1200
Rack travel in m: 11.40...11.50
2nd speed rpm : 700
Rack travel in m: 10.10...10.30 4th speed rpm : 350 Rack travel in m: 9.50...9.80 Aneroid/Altitude Compensator Test 1st version Setting : 1000 Speed rpm hPa : 1200 Pressure : 11.40...11.50 Rack travel mm Measurement 1/min: 1000 Speed 1st pressure hPa : -

Rack travel in m: 7.30...7.50

2nd pressure hPa : 90 Rack travel in m: 7.50...7.60 3rd pressure hPa : 740 Rack travel in m: 11.10...11.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 700 Speed rpm Del.quantity cm3/: 158.0...162.0 1000 s: (155.0...165.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 700 Del.quantity cm3/ : 99.0...101.0 1000 s: (96.0...104.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1260...1270 Speed LOW IDLE rpm Rack travel in mm : 4.70...4.90

Remarks:

**N18** 

Note remarks

: CUM 8,3 D16 : 18.09.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 403 436 104FB Combination no.

Injection pump

Pump designation : PES6MW100/120RS1143

: 0 413 406 137 EP type number

Governor

Governor design. : RQV350...1200MW82-1

: 0 420 083 153 Governer no.

: 3281356 Cust. part no.

Customer-spec. information Customer : CUMMINS

Engine : 6 CTAA 8.3

: 179.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Openina

: 207...210 pressure, bar

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25 : (3.10...3.30) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 13.4...13.6

100 s: (13.2...13.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 340.02nd speed Rack travel in mm: 8.4...8.6 Del.quantity cm3/: 1.2...1.6

100 s: (1.0...1.8)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.60...7.80 rpm : 1350

2nd speed travel mm : 8.60...9.00

rpm : 350

3rd speed

: 1.20...1.60 travel mm

4th speed rpm : 800

: 4.90...5.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

rpm : 1100 Speed Aneroid pressure h: 700

: 134,0...136.0 Del.quantity

: 3.50 cm3

1000 : (6.90)

RATED SPEED

1st version

Control lever position degrees: 42...50 Testing: 1st rack travel in: 11.10 rpm : 1140...1150 Speed 2nd rack travel in: 4.50 rpm : 1285...1315 Speed 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 Setting point w/out bumper spring Speed rpm : 340 Rack travel in mm : 8.5 Testing: Speed : 100 rom Minimum rack trave: 9.00 rpm : 340 Speed Rack travel in mm : 8.40...8.60

CONSTANT REGULATION rpm : 360...500 Speed

TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 12.10...12.20 2nd speed rpm : 700 Rack travel in m: 12.40...12.50

Aneroid/Altitude Compensator Test

1st version Setting : 500 Speed rpm hPa : -Pressure : 11.30...11.40 Rack travel mm

Measurement 1/min: 500 Speed

1st pressure hPa : 390 Rack travel in m: 11.50...11.60 2nd pressure hPa : 480 Rack travel in m: 12.10...12.30 3rd pressure hPa : 700

Rack travel in m: 12.40...12.50

START CUT-OUT

1/min: 270 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm\_ : 700 Speed

Del.quantity cm3/: 134.5...137.5 1000 s: (132.0...140.0)

cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: rpm\_ : 500 Speed

Del.quantity cm3/: 115.0...117.0 1000 s: (113.0...119.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.10 rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 205.0...225.0

1000 s: (202.0...228.0) Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 340

Rack travel in mm : 8.40...8.60 Del.quantity cm3/: 12.0...16.0 1000 s: (10.0...18.0)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

Note remarks

: CUM 8,3 D15 Test sheet : 20.09.91 Edition : 07.91 Replaces : ISO-4113 Test oil

: 0 403 436 109 Combination no.

Injection pump

Pump designation : PES6MW100/120RS1143

: 0 413 406 137 EP type number

Governor

Governor design. : RQV300...1050MW82-4

: 0 420 083 168 Governer no.

Customer-spec. information : CUMMINS/US Customer

: 6 CTA-830 Engine

: 175.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 630 750 014 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15 : (3.00...3.20) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12:60...12.70

Del.quantity cm3/: 14.8...15.0

100 s: (14.6...15.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 7.7...7.9 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1210 1st speed

9.00...9.40 travel mm rpm : 1100 2nd speed

: 7.90...8.10 travel mm

rpm : 550 : 3.00...3.60 rpm : 300 3rd speed

travel mm

4th speed

: 1.10...1.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050Speed Aneroid pressure h: 900

Del.quantity : 146.0...(52.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 42...50 Testing: 1st rack travel in: 11.60 rpm : 1090...1100 Speed

2nd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1300

: 0.00...1.00 Speed rpm

LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.8

Testing: Speed rpm : 100 Minimum rack trave: 9.30

Speed rpm : 300 Rack travel in mm : 7.70...7.90

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed magn Pressure hPa :

: 10.40...10.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 225

Rack travel in m: 10.90...11.00

2nd pressure hPa : 450

Rack travel in m: 11.90...12.30

3rd pressure hPa : 900

Rack travel in m: 12.60...12.70

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm: 700 Del.quantity cm3/: 145.5...148.5 1000 s: (143.0...151.0) Spread cm3: 5.00

1000 s: (7.0)

Aneroid pressure h:

: 500 Speed mom

NSS

Del.quantity cm3/: 92.0...94.0 1000 s: (90.0...96.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.60 rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 215.0...225.0 1000 s: (212.0...228.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: CUM #3915581

Start-of-delivery mark/lock = 8.0° angular displacement of the cam after start of delivery of cylinder 1.

Note remarks

Test sheet : VOL 4,5 N 1 Edition : 20.09.91 Replaces : 07.91

Test oil : ISO-4113

Combination no. : 0 403 444 131

Injection pump

Pump designation : PES4MW100/320RS1220

EP type number : 0 413 404 116

Governor

Governor design. : RQV300...1100MW39-4

Governer no. : 0 420 083 067

Customer-spec. information Customer : VME

Engine : TD45B

1st version kW : 82.5 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values j

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 9.4...9.6

100 s: (9.2...9.8)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 6.2...6.4

Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9) Spread cm3 : 0.3

opread cmo: 0.5 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1220

travel mm : 9.20...9.60

2nd speed rpm : 1150

travel mm : 8.40...8.60

3rd speed rpm : 420

travel mm : 1.70...2.30

4th speed rpm: 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version

N23

Control lever position degrees: 100...108 Testing: 1st rack travel in: 10.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1195...1225 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.3 Testing: Speed rpm : 200
Minimum rack trave: 7.80
Speed rpm : 300
Rack travel in mm : 6.20...6.40 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...140.0 1000 s: (127.0...143.0) LOW IDLE

rpm : 300

Rack travel in mm : 6.20...6.40
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

N24

Speed

Note remarks

: MB 4,0 1 3 Test sheet : 08.10.91 Edition : 07.91 Replaces : ISO-4113 Test oil

Combination no. : 0 403 444 133

Injection pump

Pump designation : PES4MW100/720RS1212

: 0 413 404 114 EP type number

Governor

Governor design. : RQV300...1200MW50-20

: 0 420 083 252 Governer no.

Customer-spec. information Customer : MB-NFZ

: 0M 364 LA Engine

: 99.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 9.00...12.00

N25

: 1-3-4-2 Firing order

: 0-90-180-270 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.8...7.0 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1450 1st speed : והמח 9.50...9.90 travel mm

1340 2nd speed rpm

8.50...8.70 travel mm

500 3rd speed rpm 2.70...3.30 travel mm

300 4th speed rom

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 700

Del.quantity

: 98.0...100.0 1000 : (96.0...102.0)

: 3.50 Spread cm3

: (6.00) 1000

RATED SPEED

1st version Control lever position degrees: 104...112 Testing: 1st rack travel in: 12.50 Speed rpm : 1240...1250 2nd rack travel in: 4.00 Speed rpm : 1390...1420 4th rack travel in: 1500 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 73...81 Setting point w/out bumper spring Lbu Speed : 300 Rack travel in mm: 6.9 Testing: : 200 Speed rpm Minimum rack trave: 8.50 rpm : 300 Rack travel in mm : 6.80...7.00 Aneroid/Altitude Compensator Test 1st version Setting Speed **Lbw** : 500 Pressure hPa : -: 10.90...11.00 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 200 Rack travel in m: 11.90...12.00 2nd pressure hPa : 310 Rack travel in m: 12.80...13.10 3rd pressure hPa : 700 Rack travel in m: 13.50...13.60 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Ameroid pressure h: 700 rpm : 500 Speed Del.quantity cm3/: 83.5...86.5 1000 s: (81.0...89.0) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 40.0...42.0 1000 s: (38.0...44.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.50 Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 85.0...95.0 1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/ : 10.0...14.0 1000 s: (7.5...16.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

N26

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 4,0 I 5 Test sheet : 20.09.91 Edition Replaces : ISO-4113 Test oil : 0 403 444 136 Combination no. Injection pump Pump designation : PES4MW100/720RS1212 : 0 413 404 114 EP type number Governor Governor design. : RQV300...1300MW123-1 : 0 420 083 256 Governer no. Customer spec. information : MB-NFZ Customer : 0M364LA Engine 1st version kW : 102.0 : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar : 1 680 750 015 Test lines Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32

3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order : 0-90-180-270 Phasing : 0.50 (0.75) Tolerance + - \* BASIC SETTING rpm: 1300 1st speed Rack travel in mm : 13.20...13.30 Del.quantity cm3/: 10.1...10.3 100 s: (9.9...10.5) cm3 : 0.3 Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1450 1st speed 9.50...9.90 travel mm 1340 2nd speed rpm : 8.50...8.70 travel mm 3rd speed 500 rpm 2.70...3.30 travel mm : 300 4th speed COM : 1.30...1.70 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1340 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1300 Speed Aneroid pressure h: 700 : 101.0...103.0 Del.quantity 1000 : (99.0...105.0) : 3.50 cm3 Spread 1000 : (6.00)

RATED SPEED

N27

Prestroke mm

1st version Control lever position degrees: 107...115 Testing: 1st rack travel in: 12.20 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1445...1475 Speed 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testing: rpm : 200 Speed Minimum rack trave: 8.00 : 300 rom Rack travel in mm : 6.40...6.60 CONSTANT REGULATION rpm : 320...550 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed man hPa : -Pressure : 10.10...10.20 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 200 Rack travel in m: 10.90...11.10 2nd pressure hPa : 400 Rack travel in m: 12.60...12.80 3rd pressure hPa : 700 Rack travel in m: 13.20...13.30 START CUT-OUT 1/min: 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm: 600 Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5)

cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 36.0...38.0
1000 s: (34.0...40.0) **BREAKAWAY** 1st version 1mm rack travel less than Full load rack tr: 12.20

Speed STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 85.0...95.0 1000 s: (82.0...98.0)

rpm : 1340...1350

LOW IDLE

rpm : 300 Speed Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

N28